Vol. 983 Number 1

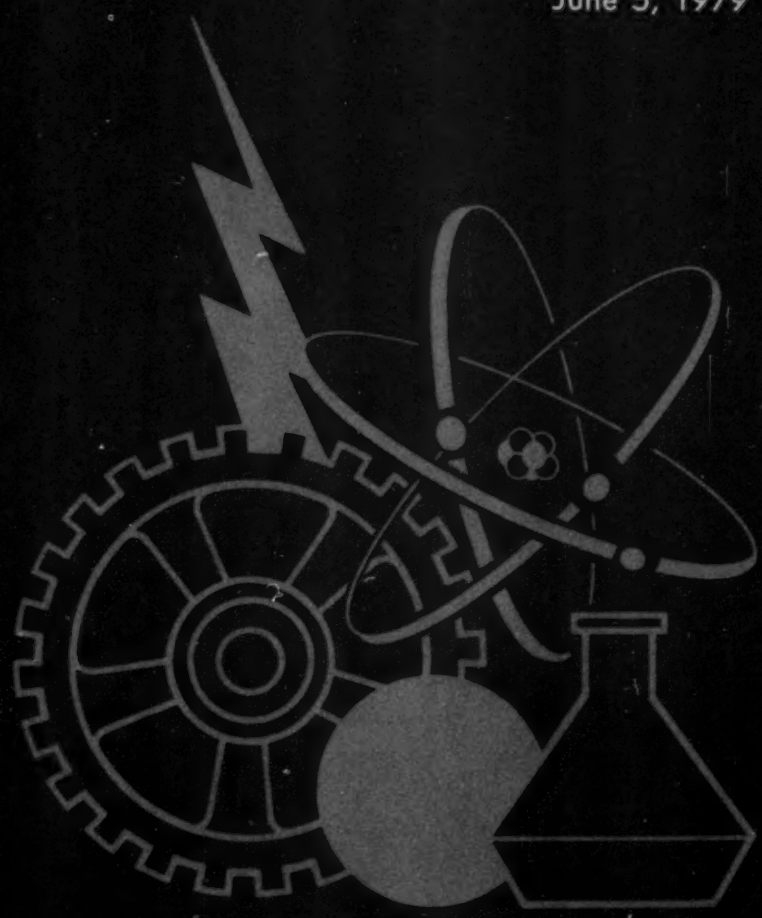
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

June 5, 1979



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

June 5, 1979 Volume 983 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER,
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of April 1979

Affirmed	183
Affirmed in Part	25
Reversed	79
Total	287

Revised Patent Application Filing Receipt

As a part of the new automated patent application information system, a revised Filing Receipt will be put into use in June 1979. The major modification is a change in size from the current 3 x 5 inch size to a larger 8½ x 11 inch size. It should be noted that this change is consonant with the recently announced, government-wide policy to use 8½ x 11 inch paper.

The same information currently appearing on the Filing Receipt form will be retained on the revised form. In addition, all information supplied by applicant relating to prior domestic, foreign and PCT international applications will be printed on the Receipt. Applicants are requested to verify all of the data printed on the Receipt and notify the Patent and Trademark Office of any errors. Such notification should be directed to the attention of the Application Division.

RICHARD J. SHAKMAN,
May 14, 1979. *Assistant Commissioner for Administration.*

Patent Suits

Notices under 35 U.S.C. 290 : Patent Act of 1952

3,032,381, Poerio Carpigiani, ANTI-DRIPPING PISTON COCK, PARTICULARLY ADAPTED FOR DENSE LIQUIDS OF FLUID PASTY SUBSTANCES, **filed** Jan. 7, 1976, D.C., N.D. Ill. (Chicago), Doc. 76c42, *Poerio Carpigiani* v. *Beatrice Foods Co. and Taylor Freezer.* Final judgment entered in favor of defendants on Mar. 23, 1979.

3,153,509, Vernie W. Curtis and Walter L. Curtis, MANUALLY MANEUVERABLE ROW CROP SPRAYER, **filed** July 17, 1975, D.C., W.D. Ky. (Bowling Green), Doc. C-75-0043-B(B), *Vernie Curtis and Walter Leroy Curtis* v. *Reid Welch.* Order of dismissal permanently enjoining and prohibiting defendant from directly or indirectly manufacturing manually maneuverable row-crop sprayers in violation of plaintiffs' patent entered Apr. 10, 1979.

3,161,347, Gilbert H. Hannon, BAG PACKAGE, **filed** Apr. 10, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c1419, *W. R. Grace & Co.* v. *Union Carbide Corp.*

3,232,162, Textron Industries, Inc., BLIND LOCKED SPINDLE RIVET AND METHOD FOR APPLYING THE SAME, **filed** Apr. 14, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c1252, *Textron, Inc.* v. *The Milford Rivet & Machine Co.* Judgment entered in favor of the defendant on Apr. 4, 1979.

3,281,824, Naxon Telesign Corporation, ROTATING SWITCH APPARATUS FOR CONTROLLING TRAVELING MESSAGE SIGNS, **filed** Apr. 2, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c1289, *Naxon Telesign Corp.* v. *GTE Sylvania Inc.*

3,351,033, Joseph E. Kienel, APPARATUS AND METHOD FOR SEAMING HOSIERY BLANKS, **filed** Oct. 19, 1978, D.C., W.D.N.C. (Statesville), Doc. ST-C-78-54, *Spetzman Industries* v. *Hickory Foundry & Machine Company.* Defendant is permanently enjoined from infringing claims of Kienel patent without a license filed Apr. 12, 1979.

3,362,357, J. A. Vance Company, ARCUATED TABLE SLIDE FOR EXPANDABLE TABLES, **filed** Apr. 4, 1979, D.C., W.D.N.C. (Statesville), Doc. ST-C-79-11, *Sun Metal Products, Inc.* v. *Acme Metal Slide, Inc.*

3,390,520, Fred P. Mattson, AIR SUPPLYING DEVICE FOR INTERNAL-COMBUSTION ENGINES, **filed** Apr. 4, 1979, D.C., W.D. Wis. (Madison), Doc. 79-C-135, *Fred P. Mattson* v. *Ford Motor Company.*

3,400,579, Ashland Oil & Refining Company, FOUNDRY BINDER COMPOSITION COMPRISING BENZYLIC ETHER RESIN, POLYISOCYANATE AND TERTIARY AMINE, **filed** Nov. 14, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78-730, *Ashland Oil, Inc.* v. *Acme Resin Corporation.*

3,426,445, Vincent B. Steffen, BASE FOR STEEL STORAGE BIN ; **Reg. No. 868,902** (AIR-FRAME), Harvestall Industries, Inc., **filed** Apr. 13, 1979, D.C., N.D. Ind. (South Bend), Doc. 879-88, *Harvestall Industries, Inc. and Vincent B. Steffen* v. *Levi Hochstetler et al.*

3,590,326, Westinghouse Electric Corporation, OVERCURRENT PROTECTIVE DEVICE ; **3,818,275,** same, CURRENT INTERRUPTER INCLUDING IMPROVED TRIP CIRCUIT USING CURRENT TRANSFORMERS ; **3,826,951,** same, CIRCUIT BREAKER WITH REPLACEABLE RATING ADJUSTER AND INTERLOCK MEANS ; **3,852,660,** same, CIRCUIT BREAKER FAULT SIMULATOR ; **3,924,160,** same, CIRCUIT BREAKER WITH DETACHABLY CONNECTED FAULT SIMULATOR, **filed** Apr. 3, 1979, D.C. Del. (Wilmington), Doc. 79-174, *Westinghouse Electric Corporation* v. *Gould, Inc. and I-T-E Imperial Corporation.*

3,766,817, Prodyne Enterprises, FOOD SLICER, **filed** Apr. 6, 1979, D.C., N.D. Tex. (Dallas), Doc. CA3-79-0435-H, *Prodyne Enterprises, Inc.* v. *Eddie Parker Interests, Inc.*

3,870,223, The Mead Corporation, DOUBLE WING POCKET PORTFOLIO AND FILE FOLDER, **filed** Jan. 10, 1979, D.C., S.D. Miss. (Jackson), Doc. J79-0011(C), *The Mead Corporation* v. *National Blank Book Company, Inc.* Judgment of dismissal without prejudice with all costs to be paid by plaintiff filed on Apr. 2, 1979.

3,818,275. (See 3,590,326.)

3,826,951. (See 3,590,326.)

3,852,660. (See 3,590,326.)

3,924,160. (See 3,590,326.)

4,098,407, Lumber Systems, Inc., LUMBER SORTING APPARATUS, **filed** Dec. 7, 1978, D.C., W.D. Ark. (Hot Springs), Doc. 78-6049, *Harvey Engineering and Manufacturing Corporation* v. *Lumber Systems, Inc.* Order transferring case to District of Oregon filed Apr. 4, 1979.

Re. 27,330, Emil G. Maremann, THERMALLY INSULATED TANK STRUCTURE, **filed** Apr. 9, 1979, D.C.N.J. (Camden), Doc. C79-1121, *Marvacon Industries, Inc.* v. *Thermacon Industries Inc.*

D. 249,780, Noel Gonzalez, PYRAMID RING, **filed** Apr. 2, 1979, D.C., S.D. Fla. (Miami), Doc. 79-1702-C-JE, *Noel Gonzalez* v. *Metro Casting Co., Inc.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,567,680, Re. S.N. 026,387, Filed Apr. 2, 1979, Cl. 260/42.15, SURFACE MODIFIED PIGMENTS AND METHOD FOR PRODUCING SAME AND ELASTOMERS CONTAINING SAME, Joseph Iannicelli, Owner of Record: *J. M. Huber Corporation, Locust, N.J.,* Attorney or Agent: Harold H. Flanders, Ex. Gp.: 141

3,602,936, Re. S.N. 951,492, Filed Oct. 16, 1978, Cl. 15/181, ROTARY BRUSH SECTION, Arthur E. Drumm, Owner of Record: *Inventor,* Attorney or Agent: David H. Wilson, Ex. Gp.: 242

3,673,140, Re. S.N. 004,109, Filed Jan. 17, 1979, Cl. 260/22 TN, ACTINIC RADIATION CURING COMPOSITIONS AND METHOD OF COATING AND PRINTING USING SAME, Joseph F. Ackerman, Owner of Record: *Inmont Corporation, Clifton, N.J.,* Attorney or Agent: F. W. Wyman, et al., Ex. Gp.: 141

3,713,864, Re. S.N. 004,105, Filed Jan. 17, 1979, Cl. 428/203, METHOD OF PRINTING OR COATING USING ACTINIC RADIATION SETTING OF APPLIED COATING AND COATED PRODUCT, Joseph Francis Ackerman, Owner of Record: *Inmont Corporation, Clifton, N.J.,* Attorney or Agent: F. W. Wyman, et al., Ex. Gp.: 164

3,760,370, Re. S.N. 884,468, Filed Mar. 17, 1978, Cl. 364/200, CALCULATOR WITH A NUMBER PROCESSING SYSTEM, Michael J. Cochran, Owner of Record: *Tektronix, Inc., Beaverton, Oreg.,* Attorney or Agent: Adrian J. Larue, Ex. Gp.: 236

3,852,041, Re. S.N. 003,871, Filed Apr. 27, 1979, Cl. 422/288 F, LOW PROFILE CATALYTIC CONVERTER, Albert J. Moore, et al., Owner of Record: *General Motors Corporation, Detroit, Mich.,* Attorney or Agent: Frederick M. Ritchie, et al., Ex. Gp.: 171

3,853,012, Re. S.N. 021,965, Filed Mar. 19, 1979, Cl. 76/425.6, PIPETTES, Emil A. Scordato, et al., Owner of Record: *Medical Laboratory Automation, Inc., Mount Vernon, N.Y.,* Attorney or Agent: William P. Keegan, Ex. Gp.: 244

3,942,338, Re. S.N. 025,928, Filed Apr. 2, 1979, Cl. 64/30 D, TORQUE LIMITING COUPLING, James L. Furlette, et al., Owner of Record: *Excel Corporation, Fenton, Mich.,* Attorney or Agent: Ernest I. Gifford, et al., Ex. Gp.: 345

3,962,935, Re. S.N. 915,008, Filed Jun. 13, 1978, Cl. 74/812, VARIABLE SPEED WINCH, Albert John Hutton, et al., Owner of Record: *Barwin Pty, Limited, Granville, near Sydney, New South Wales, Australia,* Attorney or Agent: Karl W. Flocks, Ex. Gp.: 345

3,972,961, Re. S.N. 969,934, Filed Dec. 15, 1978, Cl. 260/857 G, PROCESS FOR THE PREPARATION OF GRAFT COPOLYMERS, Clarence Frederick Hammer, et al., Owner of Record: *E. I. Du Pont de Nemours and Company, Wilmington, Del.,* Attorney or Agent: Paul R. Steyermark, Ex. Gp.: 142

4,030,042, Re. S.N. 028,878, Filed Apr. 10, 1979, Cl. 330/18, FEEDBACK AMPLIFIERS, Allen LeRoy Limberg, Owner of Record: *RCA Corporation, New York, N.Y.,* Attorney or Agent: E. M. Whitacre, Ex. Gp.: 252

4,043,318, Re. S.N. 014,653, Filed Feb. 23, 1979, Cl. 126/271, SOLAR ENERGY COLLECTOR, Yu K. Pei, Owner of Record: *Owens-Illinois, Inc., Toledo, Ohio,* Attorney or Agent: J. R. Nelson, et al., Ex. Gp.: 345

4,056,178, Re. S.N. 020,282, Filed Mar. 14, 1979, Cl. 192/58 B, MAGNETICALLY ACTUATED VISCOUS FLUID COUPLING, Rodney H. Detty, Owner of Record: *Eaton Corporation, Cleveland, Ohio,* Attorney or Agent: Robert J. McCloskey, et al., Ex. Gp.: 352

4,080,043, Re. S.N. 026,686, Filed Apr. 3, 1979, Cl. 350/76, BINOCULAR TELESCOPE, Erwin Altenheiner, et al., Owner of Record: *Carl Zeiss Stiftung, Oberkochen/Wuerttemberg, Germany,* Attorney or Agent: Roy C. Hopgood, et al., Ex. Gp.: 257

4,080,415, Re. S.N. 021,878, Filed Mar. 19, 1979, Cl. 264/65, METHOD OF PRODUCING HIGH DENSITY SILICON CARBIDE PRODUCT, John A. Coppola, et al., Owner of Record: *The Carborundum Company, Niagara Falls, N.Y.,* Attorney or Agent: David E. Dougherty, et al., Ex. Gp.: 147

4,099,052, Re. S.N. 020,249, Filed Mar. 13, 1979, Cl. 250/283, MASS SPECTROMETER BEAM MONITOR, Charles R. McKinney, Owner of Record: *E. I. Du Pont de Nemours and Company, Wilmington, Del.,* Attorney or Agent: Charles A. Weigel, Jr., Ex. Gp.: 256

4,107,720, Re. S.N. 028,420, Filed Apr. 9, 1979, Cl. 357/22, OVERLAY METALLIZATION MULTI-CHANNEL FREQUENCY FIELD EFFECT TRANSISTOR, Robert A. Pucel, et al., Owner of Record: *Raytheon Company, Lexington, Mass.,* Attorney or Agent: Joseph D. Pannone, et al., Ex. Gp.: 254

4,114,117, Re. S.N. 025,426, Filed Mar. 30, 1979, Cl. 333/70 CR, TUNABLE ELECTRICAL FILTER NETWORK, Michael Alan Ford, Owner of Record: *Perkin-Elmer Limited, Beacons Field Buck, England,* Attorney or Agent: S. A. Giarratana, Ex. Gp.: 256

PATENT NOTICES

Certificates of Correction for the Week of June 5, 1979

Re. 29,612	4,102,070	4,124,960	4,137,796
3,739,510	4,103,290	4,125,556	4,137,925
3,777,098	4,104,514	4,125,871	4,138,511
3,929,714	4,105,033	4,126,307	4,138,668
3,948,968	4,105,365	4,126,403	4,138,744
3,951,828	4,105,675	4,127,167	4,138,806
3,960,702	4,106,350	4,127,245	4,138,852
3,965,203	4,107,323	4,128,280	4,138,960
3,972,809	4,107,342	4,128,538	4,139,094
3,994,163	4,107,743	4,129,082	4,139,158
4,013,205	4,107,852	4,129,156	4,139,197
4,038,456	4,107,984	4,129,962	4,139,272
4,038,640	4,108,540	4,130,070	4,139,498
4,039,490	4,108,881	4,130,101	4,139,578
4,041,057	4,108,941	4,130,222	4,139,624
4,044,203	4,109,421	4,130,351	4,139,658
4,051,107	4,109,578	4,130,377	4,139,701
4,052,249	4,110,263	4,130,827	4,139,844
4,065,571	4,110,311	4,131,131	4,139,868
4,069,487	4,110,399	4,131,322	4,140,080
4,074,727	4,110,631	4,131,338	4,140,092
4,075,206	4,111,121	4,132,293	4,140,127
4,076,206	4,111,288	4,132,327	4,140,230
4,077,588	4,111,399	4,132,328	4,140,260
4,077,626	4,111,431	4,132,606	4,140,273
4,078,142	4,111,536	4,132,783	4,140,312
4,079,469	4,111,583	4,132,843	4,140,335
4,079,518	4,111,590	4,133,433	4,140,343
4,079,619	4,111,924	4,133,687	4,140,401
4,080,010	4,111,956	4,133,725	4,140,420
4,081,802	4,112,096	4,133,782	4,140,486
4,082,067	4,112,167	4,133,786	4,140,559
4,082,207	4,112,462	4,133,830	4,140,762
4,083,836	4,113,028	4,134,237	4,140,855
4,083,379	4,113,379	4,134,366	4,140,950
4,089,380	4,114,053	4,134,517	4,141,062
4,089,404	4,115,478	4,134,765	4,141,174
4,089,504	4,117,869	4,134,794	4,141,318
4,091,086	4,118,057	4,134,849	4,141,465
4,091,198	4,118,302	4,135,487	4,141,519
4,092,863	4,118,774	4,135,519	4,141,592
4,093,504	4,118,887	4,135,523	4,141,636
4,095,144	4,119,466	4,135,639	4,141,694
4,096,652	4,120,986	4,136,036	4,141,718
4,097,180	4,121,294	4,136,113	4,141,979
4,097,250	4,121,495	4,136,152	4,142,170
4,097,792	4,122,254	4,136,388	4,142,243
4,097,793	4,122,459	4,136,671	4,142,749
4,098,821	4,123,328	4,136,851	4,142,787
4,098,865	4,123,341	4,136,903	
4,099,703	4,123,605	4,136,958	
4,100,762	4,124,276	4,137,079	
4,101,464	4,124,598	4,137,533	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 323-4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 21, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-11-78
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-2-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-6-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-20-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	12-1-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	11-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	2-3-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-1-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	8-25-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-22-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-11-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	4-7-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-30-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	12-20-77

Expiration of patents: The patents within the range of numbers indicated below expire during April 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,027,558 to 3,031,668, inclusive
Plant Patents..... Numbers 2,135 to 2,142, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JUNE 5, 1979

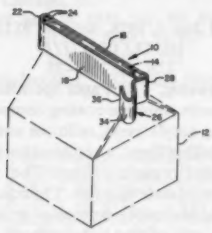
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T983,001
UNITARY CLAMP FOR RESEALING MILK CARTONS

Darius A. Coffey, 13613 Occidental Ave. South, Seattle, Wash. 98168

Filed Apr. 21, 1978, Ser. No. 898,868
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—259 R
1 Sheet Drawing. 11Pages Specification



A clamp for resealing an opened milk carton or similar container includes adjacent clamping legs interconnected by a resilient medial portion and movable relative to each other from a diverging position when the clamp is open to a substantially parallel relationship when the clamp is closed. A lever arm connected to one of the clamping legs overlaps the extremity of the other clamping leg to limit the distance by which the extremities of the clamping legs may be separated, and an elastically movable latch, located intermediate the free extremity of the lever arm and the end of the clamping leg to which the lever arm is attached, engages the extremity of the other clamping leg to retain the sealing clamp in its closed position. The clamp may be made from a single strip of sheet metal appropriately bent, or from other material having suitable elasticity and durability. High friction surfaces on the opposing or inner faces of the clamping legs resist displacement of the sealing clamp from a milk carton on which the clamp is closed.

T983,002
DIELECTRIC COATING COMPOSITIONS AND RECORDING SHEETS MADE THEREFROM

Charles H. Coney, 2008 Canterbury Rd., and Don R. Leonard, Rte. 15 421 Old Castle Rd., both of Kingsport, Tenn. 37660

Continuation of Ser. No. 850,163, Nov. 10, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,425
Int. Cl.[2] B32B *9/06;* C08L *1/12*
U.S. Cl. 428—498
No Drawing. 18 Pages Specification

Coating compositions useful as a dielectric layer for electrostatic recording sheet material are disclosed. The compositions comprise cellulose acetate butyrate having a butyryl content of from about 47 to about 55%, an acetyl content of from about 0.5 to about 15%, a hydroxyl content of from 0 to about 1.0% and a viscosity of from about 0.2 to about 20 seconds. Preferably, the composition includes an ester prepared from gum, wood and/or tall oil rosin at an amount of up to about 70% based on the combined weight of the cellulose ester and rosin ester.

T983,003
COATING COMPOSITIONS

Don R. Leonard, Rte. 15, Old Castle Rd., and Charles H. Coney, 2008 Canterbury Rd., both of Kingsport, Tenn. 37660

Filed Sep. 14, 1978, Ser. No. 942,110
Int. Cl.[2] B32B *33/00;* C08L *1/12*
U.S. Cl. 428—335
No Drawing. 16 Pages Specification

Coating compositions are disclosed which provide improved resistance to the transmission of vapor through various substrates, especially paper, paperboard and regenerated cellulose. The compositions comprise one or more cellulose esters, and a small amount of a blend of paraffin and an amide of a long chain saturated or unsaturated fatty acid. The composition is in a conventional solvent and preferably includes conventional plasticizers. Conventional additives such as pigments, stabilizers, etc., may be used.

T983,004
STABILIZED WAX COMPOSITIONS AND THEIR PREPARATION

Marcia A. Taylor, 164 Walton Ct., Kingsport, Tenn. 37663, and Robert J. Evans, 2060 Canterbury Rd., Kingsport, Tenn. 37660

Filed May 18, 1978, Ser. No. 907,229
Int. Cl.[2] B32B *9/00, 15/04;* C08L *91/06*
U.S. Cl. 428—467
No Drawing. 10 Pages Specification

Disclosed is a means to disperse the antioxidant monotertiarybutyl hydroquinone (TBHQ) in wax, particularly paraffin wax, in concentrations of up to about 2.5% by weight of the wax through the use of acetylated monoglycerides as solvents for the TBHQ which renders the TBHQ and wax highly compatible. Such stabilized wax compositions find extensive use as coatings for food and in waxed liners for food cartons and the like.

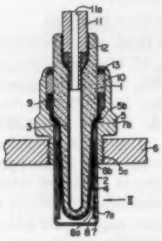
T983,005
OXYGEN CONCENTRATION DETECTOR

Yoshinori Akiyama, Kariya; Masami Ouki, Nagoya, and Masatosi Suzuki, Kariya, all of Japan, assignors to Nippondenso Co. Ltd., Kariya, Japan

Filed Mar. 27, 1978, Ser. No. 890,904
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 S
2 Sheets Drawing. 21 Pages Specification

An improved oxygen concentration detector is described having an oxygen concentration sensor which produces an electromotive force in accordance with a difference between an oxygen concentration in the gas components of a gas under test and an oxygen concentration in a reference gas, and first and second electrodes formed on the gas-under-test side and the reference gas side, respectively, of the oxygen concentration sensor, so that the electromotive force produced by the oxygen concentration sensor is taken across the two electrodes, in which the improvement comprises a first protective member arranged to cover the first electrode on the oxygen concentration sensor and having a number of pores through which the gas under test can pass, and a second protective member arranged between the first electrode and the first protective

member also having a number of pores through which the gas under test can pass. The first and second protective members are spaced apart from each other to form a gap between them and the pores of the first protective member and the pores of the second protective member are arranged in a staggered relationship to each other.



The pores of the first protective member may have a louvered shape or the pores of the two protective members may partially overlap each other. The pore sizes for both of the protective members are preferably in the range of 0.5 mm to 3.0 mm. The detector assembly is effective in reducing the flow rate of the gas under test within the exposed detector so that the underlying electrode is not substantially peeled off.

T983,006

INJECTION NOZZLE ASSEMBLY

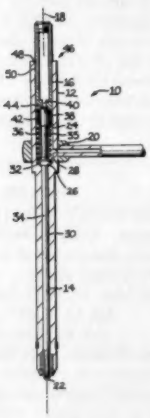
John M. Bailey, Dunlap, and Stanley J. Kranc, Morton, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 828,692, Aug. 29, 1977, abandoned. This application Sep. 12, 1978, Ser. No. 941,698

Int. Cl.[2] B05B *1/30*

U.S. Cl. 239—533.9

1 Sheet Drawing. 10 Pages Specification



An injection nozzle assembly has a housing **12**, a valve **14**, and a sleeve **16**. The housing has an axis **18** and a chamber **24**. The housing has a shoulder **26** which defines first and second chamber portions **28** and **30**, respectively. The valve has a head **32** position in the first chamber portion and a stem **34** extending from the head into the second chamber portion. Biasing means **36** biases the valve head towards the shoulder. The sleeve is positioned in the first chamber portion and moveable along the axis between a first position at which the sleeve loads the biasing apparatus and a second position at which the sleeve is free of loading contact with the biasing apparatus. In a first embodiment, a braised joint **48** maintains the sleeve at a preselected position between the first and second positions. In a second embodiment, a cap with an opening for the sleeve and a tapered inside surface cooperates with a tapered mating surface on the housing which urges the housing against the sleeve to maintain the sleeve in the desired position. In a third embodiment, a cap with an opening for the sleeve urges a wedge shaped member between the housing and sleeve to maintain the sleeve.

T983,007

CELLULOSE ESTER-ACRYLIC RESIN-MELAMINE-FORMALDEHYDE AQUEOUS EMULSION COATING COMPOSITION CONTAINING A COMBINATION SURFACTANT-CURING AGENT

Don R. Leonard, Rte. 15, 421 Old Castle Rd., Kingsport, Tenn. 37660

Filed Jun. 1, 1978, Ser. No. 911,633

Int. Cl.[2] C08L *1/14*

U.S. Cl. 260—15

No Drawing. 12 Pages Specification

Disclosed are aqueous emulsion coating compositions comprising a thermosetting acrylic resin, cellulose ester, melamine-formaldehyde crosslinking agent, a combination surfactant-curing agent and a suitable organic solvent. The cellulose ester is preferably cellulose acetate butyrate. The combination surfactant-curing agent is preferably ammonia- or amine-neutralized salts of sulfonated, ethoxylated hydrocarbons. The concentrate is emulsified in water and used as a coating composition. The coating has low solvent emission to the atmosphere when drying, provides a hard but flexible coating having excellent appearance, good durability, and rapid drying properties.

T983,008

MIXING PARTICULATE ADDITIVES INTO THERMOPLASTICS POLYMERS

Hubert Lawes, Blackpool, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 839,570, Oct. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 652,059, Jan. 26, 1976, abandoned. This application Sep. 13, 1978, Ser. No. 942,828

Claims priority, application United Kingdom, Jan. 31, 1975, 4290/75

Int. Cl.[2] C08K *3/00, 3/04*

U.S. Cl. 260—42

No Drawing. 18 Pages Specification

A method for mixing particulate additives into a thermoplastic polymer which has been made by a process which produces the polymer in a molten state is disclosed including the improvement in combination, of the successive steps: (a) converting the polymer into a solid powder 95% by weight of which is capable of passing through a 2,000 μm sieve, (b) subjecting the powdered polymer and the particulate additive to the mixing action of a rotary blade mixer in which the blades are rotating at a speed sufficient to fluidize the mixture, and thereafter (c) subjecting the mixture produced in the rotary blade mixer to the further mixing action of an internal mixer for at least 1.75 minutes. In this way the mixing cycle of the internal mixer is drastically shortened with no adverse effect on the quality of the blend obtained. The process also permits a wider range of polymers to be mixed in an internal mixer and avoids the generation of steam and consequent loss of additive normally associated with carbon black mixing operations carried out in Banbury mixers. The process is especially suited for adding carbon black to particulate low density polyethylene and copolymer thereof.

T983,009

PROCESS FOR REMOVING TOXIC PERFLUOROISOBUTYLENE

Theodore A. Treat, Washington, W. Va., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 850,221, Nov. 10, 1977, abandoned.
This application Nov. 13, 1978, Ser. No. 960,013
Int. Cl.[2] C07C *19/00*
U.S. Cl. 260—652 P
No Drawing. 9 Pages Specification

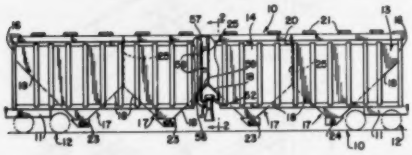
A process for converting toxic perfluoroisobutylene in a mixture of fluorine-containing compounds into a relatively nontoxic ether which comprises contacting the mixture with a solution of methanol and a selected hydrogen halide.

T983,010

VENTING STRUCTURE FOR RAILWAY CAR

Franklin P. Adler, Michigan City, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Jun. 26, 1978, Ser. No. 919,019
Int. Cl.[2] B65G *53/40*
U.S. Cl. 406—123
2 Sheets Drawing. 11 Pages Specification



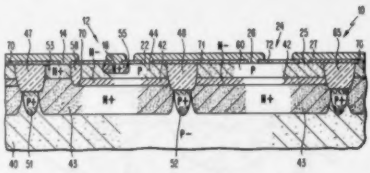
A closed top railway hopper car of a type which is pneumatically unloaded including a pressure relief valve arrangement which is supported underneath the car between spaced slope sheets of adjacent hoppers. The relief valve arrangement includes a pipe which projects upwardly through a slope sheet into the interior of the car adjacent the upper end thereof. The relief valve is located in a protected V-shaped space beneath the hoppers where it is readily accessable to the operator standing on the ground when pneumatic devices are utilized for discharging the material from the hopper car.

T983,011

ARRANGEMENT FOR STABILIZING A BIPOLAR SEMICONDUCTOR DEVICE UTILIZED IN EMITTER FOLLOWER OR CURRENT SWITCHING CONFIGURATION

Sylvester W. Giuliani, and Arnold P. Mercer, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 558,590, Mar. 14, 1975, abandoned.
This application Jul. 30, 1976, Ser. No. 710,351
Int. Cl.[2] H01L *27/02, 27/04, 27/12;* H03F *3/04*
U.S. Cl. 357—51
1 Sheet Drawing. 15 Pages Specification



An arrangement for stabilizing a bipolar semiconductor device such as might be commonly used in emitter follower or current switching configuration by the addition of lumped capacitance between the base of the semiconductor device and ground. In one preferred embodiment the lumped capacitance is derived from a flared or enlarged end of a base stabilizing resistor connected to the base of the semiconductor device, and in an alternative embodiment the capacitance is derived from a base collector junction of another unconnected semiconductor device located upon a common substrate with the semiconductor to be stabilized. The effect of the lumped capacitance, when added to the circuit, is to move the Z_{in} plot of the transistor toward the fourth quadrant of a Nyquist diagram without the addition of a large series base resistance. The addition of the lumped capacitance is preferably utilized in conjunction with a small base stabilizing resistor in order to achieve stability in the input of the semiconductor.

REISSUES

JUNE 5, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

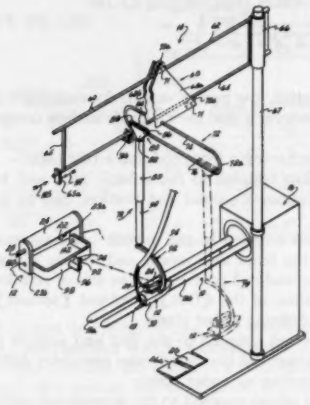
Re. 30,017
SEAMBUSTING AND PRESSING APPARATUS

Norman J. Bullock, Prospect; Frank A. Wendt, Jeffersontown; Laddie A. DePas, Louisville, all of Ky., and Walter P. Goodman, New Albany, Ind., assignors to W. M. Cissell Manufacturing Company, Louisville, Ky.

Original No. 3,964,185, dated Jun. 22, 1976, Ser. No. 600,827, Jul. 31, 1975. Continuation-in-part of Ser. No. 524,642, Nov. 18, 1974, Pat. No. 3,916,546. Application for reissue Jun. 22, 1978, Ser. No. 918,330

Int. Cl.[2] D06F *69/00*

U.S. Cl. 38—1 B **12 Claims**



1. Apparatus for opening and flattening a seam having mating edges of fabric joined together along an elongated seam line, comprising:

an elongated buck having a convex outer surface adapted to support the seam with the mating fabric edges thereof outboard, said buck having an outer free end over which said fabric is drawn in the process of dressing said seam on said convex outer buck surface, said outer free end provided with a smoothly contoured notch therein oriented to guide said seam to a position atop said convex outer buck surface as said fabric is drawn over said buck in said dressing process, and

an iron having a sole plate including a central elongated bottom surface region terminating at a forward edge in a pointed nose configuration to spread apart and thereby open the mating fabric edges of a seam when moved forwardly thereover along the seam line thereof, said central elongated bottom surface region having a length substantially less than the length of said buck and being concavely configured to correspond to said convex outer buck surface for overbusting a seam, which is sandwiched therebetween with the [melting] *mating* edges thereof adjacent said sole plate, by pressing said edges to form an angle along said seam line which substantially exceeds 180°,

said convex and concave surfaces each having a radius of curvature of less than approximately two inches and more than approximately one-half inch to facilitate appreciable overbusting and avoid spring-back while minimizing criticality in alignment of said seam line on said buck.

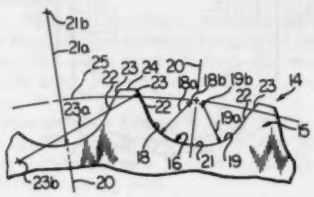
Re. 30,018
SPROCKET MEMBER CONFIGURATION

Donald E. Clemens, Tremont, and Glenn M. Haslett, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Original No. 4,016,772, dated Apr. 12, 1977, Ser. No. 615,446, Sep. 22, 1975. Application for reissue May 5, 1978, Ser. No. 903,444

Int. Cl.[2] F16H *55/30*; B62D *55/08*

U.S. Cl. 74—243 R **12 Claims**



1. In a chain drive sprocket member having a plurality of teeth defining a pitch circle having a *predetermined* radius [of approximately 20 inches], an improved pocket configuration between said teeth having opposite flank surfaces at opposite sides of the pocket radial centerline each defined by a pocket radius centered on a point spaced radially inwardly of said pitch circle and spaced circumferentially from said pocket radial centerline, and an arcuate root surface defined by a radius centered on a point on said pocket radial centerline and spaced outwardly of said pitch circle.

Re. 30,019
PRODUCTION OF HYDROCARBONS FROM UNDERGROUND FORMATIONS

Robert H. Lindquist, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

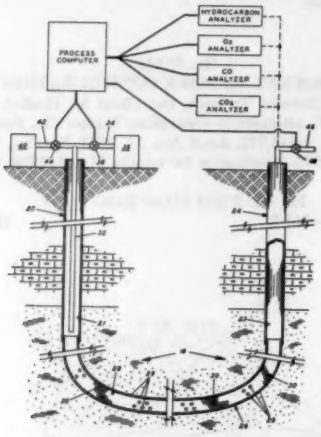
Original No. 3,892,270, dated Jul. 1, 1975, Ser. No. 476,836, Jun. 6, 1974. Application for reissue Jun. 30, 1977, Ser. No. 811,502

Int. Cl.[2] E21B *43/24*

U.S. Cl. 166—251 **16 Claims**

9. A method for converting hydrocarbons within an underground formation into combustible product gas and bringing the so-formed product gas to the earth's surface for subsequent distribution comprising connecting at least one input well with at least one producing well by a lateral connecting hole which at least in part penetrates an underground formation containing hydrocarbons, packing said connecting hole with a permeable material so that said connecting hole has a permeability in excess of the permeability of said underground formation; injecting oxidizing gas and steam down said input well into said lateral connecting hole to react with hydrocarbons in said formation by partial oxidation and by thermal cracking to form a product gas containing sufficient fractions of at least one of the components carbon monoxide, hydrogen and methane to be combustible, producing said product gas from said formation through said producing well; analyzing

said product gas for values of C_1 and C_2 hydrocarbons, carbon monoxide and carbon dioxide; and controlling the reactions within



said connecting hole based on said values to optimize the Btu value of said product gas.

Re. 30,020

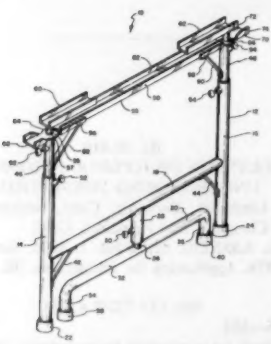
FOLDABLE WORK PLATFORM

Edward Spencer, La Grange, Ill., and Harold R. Wing, Springville, Utah, assignors to Little Giant Industries Inc., American Fork, Utah

Original No. 4,031,981, dated Jun. 28, 1977, Ser. No. 691,926, Jun. 1, 1976. Application for reissue May 5, 1978, Ser. No. 903,361

Int. Cl.[2] E04G *1/32*; F16M *11/00*

U.S. Cl. 182—153 **6 Claims**



1. A foldable work platform comprising in combination:

a base comprising two upright, hollow legs rigidly interconnected by a cross piece and a support stand rotatably attached to the cross piece for selectively giving stability to the base when in upright position;

a scaffold adjustably cooperating with the base and comprising two downwardly depending hollow members rigidly interconnected by an open cross channel, each member being telescopically received by a leg, and means for securing each leg and hollow member together;

an arm configurated as an open U-shaped channel rotatably and extensibly carried upon the scaffold at at least one end thereof; and

wooden inserts nested within the cross channel and arms, the inserts extending above the sides of the channels.

Re. 30,021

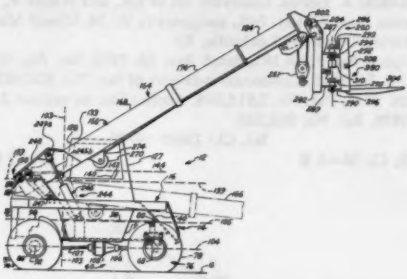
MATERIAL HANDLING MACHINE

Eugene Olson, Wausau, and Salvatore F. Aiello, Racine, both of Wis., assignors to Loed Corporation, Wausau, Wis.

Original No. 3,836,025, dated Sep. 17, 1974, Ser. No. 362,199, May 21, 1973. Application for reissue May 26, 1976, Ser. No. 690,051

Int. Cl.[2] B60P *1/48*

U.S. Cl. 414—547 **22 Claims**



1. A self-propelled, low profile vehicle for enabling a driver to carry and maneuver a load over a grade surface comprising in combination:

a vehicle body having a front end and a rear end;

front axle means coupled to the vehicle body and having first end portion, a second end portion, and an axis of rotation;

rear axle means coupled to the vehicle body substantially parallel to the front axle means and having a first end portion, a second end portion, and an axis of rotation, the axes of rotation of the [first] *front* and [second] *rear* axle means defining a first plane;

a first front wheel coupled to the first end portion of the front axle means and having an outer periphery defining a first circle having an upper point;

a second front wheel coupled to the second end portion of the front axle means and having an outer periphery defining a second circle having an upper point;

a first rear wheel coupled to the first end portion of the rear axle means and having an outer periphery defining a third circle having an upper point;

a second rear wheel coupled to the second end portion of the rear axle means and having an outer periphery defining a fourth circle having an upper point, the upper points of the first, second, third and fourth circles defining a second plane, and the points of the third and fourth circles closest to the front axle means lying in a third plane perpendicular to the second plane;

pivoting means defining a pivot axis located above the first plane and to the rear of the third plane, said pivot axis lying in a fourth plane parallel to the first plane;

a boom mounted on the pivot axis to rotate in an operating plane substantially perpendicular to the first plane, said boom extending cantilever-fashion from the pivot axis over the front axle means to a load-bearing end;

carrying means mounted on the load bearing end for carrying the load;

hydraulic means for moving the boom in the operating plane;

a source of power for moving the vehicle over the grade surface and for supplying power to the hydraulic means;

a cab for the driver positioned entirely on a first side of the operating plane;

a well in the vehicle body positioned below the boom, said well having a lower member extending below the fourth plane for receiving the boom when the boom is pivoted downward toward the front axle means, [whereby the load can be maneuvered below the grade surface] *said pivoting means and said well cooperating to define means for*

enabling the load to be maneuvered below the grade surface; and

a load-carrying platform positioned on the vehicle body above the first plane entirely on a second side of the operating plane opposite the first side of the operating plane, so that the well is positioned between the cab and the platform [and wherein the boom is extendible and retractable] *said well further defining means for enabling the boom to be extensible and retractable therein.*

Re. 30,022

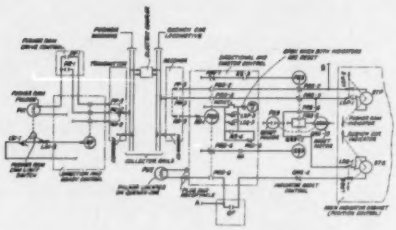
PUSHER RAM AND QUENCH CAR TRAVEL SYNCHRONIZATION SYSTEM

Vincent G. Krenke, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Original No. 3,897,311, dated Jul. 29, 1975, Ser. No. 381,363, Jul. 20, 1973. Application for reissue Jun. 16, 1977, Ser. No. 807,192

Int. Cl.[2] **C10B** *35/00, 47/00*

U.S. Cl. 202—262 **5 Claims**



1. A system for synchronizing [the travel of a pusher ram in a coke oven chamber with], *with the travel of a pusher ram in a coke oven chamber,* the travel of a coke quenching car [receiving] *that receives* hot coke from an oven chamber and [propelled] *that is moved* by a locomotive relative to such oven chamber, wherein the improvement comprises:

a. a switch means activated by said pusher ram as it moves toward and into an oven chamber to be pushed and closing an electrical circuit;

b. a [pulse transmitter] *first pulser* in said circuit, which is activated when said switch means closes, that emits pulses;

c. electrical receiver means in said locomotive that receives said emitted pulses and thereafter energizes an electrical circuit wherein there is

d. a first stepping motor [that actuates said pusher ram] *energized* in a step-by-step manner, responsive to the received pulses [and circuit energization;] *from said first pulser;*

e. a *second* pulser, in said quenching car, that is [energized] *activated* by [a signal emitted] *movement of said quenching car which emits pulses that are received* by said receiver;

f. a second stepping motor that is energized [by said pulser and that moves said quenching car in a step-by-step manner in sequence with said pusher ram;], *in a step-by-step manner, responsive to the received pulses from said second pulser;* and

g. indicator means in said locomotive that is responsive to said [stepping motors] *first stepping motor and said second stepping motor* and indicates the relative positions of the pushing ram and the quenching car.

Re. 30,023

METHOD FOR PROTEIN FORTIFICATION OF EXTRA PUMPED MEATS

Robert L. Hawley, Chesterfield, and William B. Tuley, Ballwin, both of Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Original No. 3,989,851, dated Nov. 2, 1976, Ser. No. 665,830, Mar. 11, 1976. Continuation-in-part of Ser. No. 500,219, Aug. 26, 1974, abandoned. Application for reissue May 25, 1978, Ser. No. 909,598

Int. Cl.[2] **A23L** *1/27;* **A23B** *4/02, 4/14;* **A23L** *1/31*

U.S. Cl. 426—266 **6 Claims**

1. In a method of forming a meat product of the type wherein a liquid medium including a nutritional protein isolate, water and curing salt is prepared, stitch pumped into natural meat muscle tissue and allowed to cure, the improvement comprising:

a. preparing the liquid medium by first hydrating, at least 7% by weight of the medium, a salt tolerant protein isolate which forms a gel upon heat setting, in water, prior to admixing the curing salts;

b. subsequently admixing the curing salts to the hydrated salt tolerant protein isolate;

c. stitch pumping the natural meat tissue with the liquid medium to from 140 to 165% of its green weight;

wherein, upon curing, the liquid medium cooks to a uniformly distributed, meat-like gel, the extra pumped meat product maintains the same nutritional protein value and substantially identical textural properties of natural meat tissue, the protein substantially retains its hydrated form in the final product and there is substantially no protein separation.

Re. 30,024

4-AMINO (OR HYDRAZINO)-2-(PYRIDINYL)PYRIMIDINES

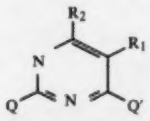
George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Original No. 4,032,523, dated Jun. 28, 1977, Ser. No. 708,195, Jul. 23, 1976. Division of Ser. No. 555,067, Mar. 3, 1975, Pat. No. 4,018,770. Application for reissue Jun. 5, 1978, Ser. No. 912,947

Int. Cl.[2] **C07D** *401/04*

U.S. Cl. 544—328 **8 Claims**

1. A compound of the formula



where Q is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents or N-oxide thereof, Q′ is [hydroxy, halo,] hydrazino or amino, R_1 is hydrogen, lower-alkyl or cyano, and R_2 is hydrogen, lower-alkyl, hydroxy or halo.

PLANT PATENTS

GRANTED JUNE 5, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,423

YELLOW PEACH TREE

Eizo Kurakata, 1-14-18, Kamikitazawa, Setagaya-ku, Tokyo, Japan

Filed Apr. 20, 1978, Ser. No. 898,285
Claims priority, application Japan, Oct. 24, 1977, 52-127193
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of yellow peach tree, substantially as illustrated and described herein, characterized over the known yellow peach tree by having large lanceolate leaves with a slightly swollen margin which is not as swollen as that of Tusberta; rose-pink and largely polliniferous flowers which are small flowered and self-fertilized; a great amount of fruit which has a sturdy skin, an extremely beautiful appearance, a regular round shape, and a yellow color partially tinged with red where exposed to sun; and flesh which is yellow in color and very delicate in texture with a very small amount of fibers and which has a clingstone, the flesh portions around the stone being of a light color, the taste of the flesh being of a slightly sourish-sweetness and having substantially no difference between the top and the bottom of the fruit, and the flesh having a distinctive good flavor.

PATENTS

GRANTED JUN. 5, 1979

ERRATA

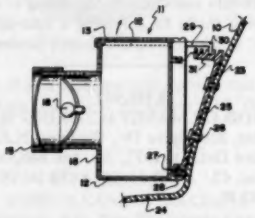
For CLASS	See PATENT NO.
074–230.17 E	4,157,042
409–113	4,157,055
414–676	4,157,140
414–440	4,157,141
585–434	4,157,354
585–321	4,157,355
585–415	4,157,356
336–192	4,157,519

PATENTS

GRANTED JUNE 5, 1979

GENERAL AND MECHANICAL

4,156,942
LAMP ASSEMBLY FOR HELMETS, HARD HATS AND THE LIKE
Rodney H. Isfeld, Box 69, Gimli, Manitoba, Canada
Filed Feb. 27, 1978, Ser. No. 881,688
Int. Cl.[2] A42B *3/00*
U.S. Cl. 2—422 **8 Claims**



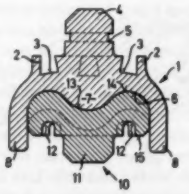
1. A lamp assembly for the front of a protective hat such as a helmet hard-hat and the like, comprising in combination a battery case for detachably receiving dry batteries and a lens assembly secured to said battery case and being operatively connected to the batteries within the battery case, and means to detachably secure said assembly to the front of the associated protective hat, said means to detachably secure said assembly to the front of the associated protective hat including means to adjust, within limits, the angle of the lamp assembly in a fore and aft position relative to said protective hat, said means to adjust the angle of the lamp assembly including a longitudinal pivot attachment of the lower side of said battery case to said protective hat, at least one resilient leg extending rearwardly of said battery case adjacent the upper side thereof and means on said front of said protective hat selectively engageable by the distal end of said leg to detachably hold said lamp assembly in the desired angle relative to said protective hat.

4,156,943
HIGH-STRENGTH POROUS PROSTHETIC DEVICE AND PROCESS FOR MAKING THE SAME
John P. Collier, 12 Chandler Dr., Hanover, N.H. 03755
Filed Aug. 24, 1977, Ser. No. 827,236
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.9 **17 Claims**

1. A prosthetic device composed substantially entirely of a porous metallic material that is substantially non-corrodable and non-degradable by body fluids, said porous material comprising a plurality of particles of said metallic material fused together at points of contact with each other to define a plurality of connected, interstitial pores distributed throughout the porous metallic material, the average interstitial pore size of said material being from about 100 micrometers to about 500 micrometers, the porosity of the material being between 10 and 40 percent, and the compression strength of the material being at least about 20,000 psi, said device being formed by the process of heating a metallic powder in a non-oxidizing environment to a temperature within about 25° C. of its melting point for a period of from a few minutes to about one hour.

8. A method of making a prosthetic device composed substantially entirely of a porous metallic material that is substantially non-corrodable and non-degradable by body fluids, comprising molding a metallic powder to a shape of the device, heating the powder in a non-oxidizing environment to a temperature within about 25° C. of its melting point for a period of from a few minutes to about one hour so as to fuse particles of the powder together at points of contact with each other to form a porous metallic material having a plurality of connected, interstitial pores distributed throughout the material with average interstitial pore size of from about 100 micrometers to about 500 micrometers and with porosity between 10 and 40 percent, and having compression strength of at least about 20,000 psi.

4,156,944
TOTAL ANKLE PROSTHESIS
Adam Schreiber, Küsnacht; Hans Zollinger, Zollikon, and Michael Dexel, Zurich, all of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Nov. 4, 1977, Ser. No. 848,647
Claims priority, application Switzerland, Nov. 15, 1976, 14341/76
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **3 Claims**



1. A total ankle prosthesis comprising

a lower part for anchoring in a talus, said lower part having a convex upper surface in sagittal section, and a horizontal bottom surface to abut the talus;

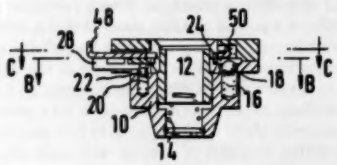
an upper part for anchoring in a tibia, said upper part having a concave lower surface in sagittal section slidably guided on said convex surface of said lower part and a pair of side walls depending over said lower part to receive said lower part therebetween, said walls extending through and beyond said bottom surface of said lower part to obviate excessive rubbing of the bottom ends of the tibia and a fibula on said lower part and on the talus;

each of said surfaces having a wave form in frontal cross-section with one of said surfaces having a rib-like raised portion centrally thereof and the other of said surface having a guide groove receiving said raised portion.

4,156,945
PROSTHETIC WRIST FITTING

Denis R. W. May, London, England, assignor to J. E. Hanger & Company Limited, London, England

Filed Oct. 26, 1977, Ser. No. 845,748
Claims priority, application United Kingdom, Nov. 18, 1976, 48087/76
Int. Cl.[2] A61F 1/06
U.S. Cl. 3—12.4 6 Claims

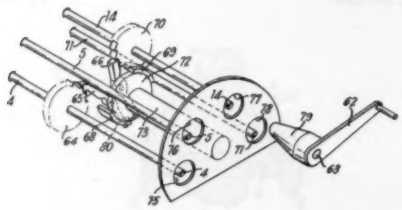


1. A prosthetic wrist fitting comprising a casing attachable to a forearm termination, and a sub-unit insertable into said casing and fixable in relation thereto, said sub-unit comprising a main body, a generally cylindrical central socket in said body, an ejector spring disposed adjacent the base of said socket, an internally toothed ring surrounding the mouth of said socket, a plug complementary to said socket and carrying a terminal device, an externally toothed ring on said plug meshable with said internally toothed ring, a circumferential groove around said plug, a spring resisted keep ring slidable transversely across the bore of said socket and engageable with said groove in said plug, and manually operable means to disengage said keep ring from said groove to permit ejection of said plug from said socket by said ejector spring.

4,156,946
TRANSFER DEVICE

David J. Attenburrow, Bridlington, England, assignor to Reed International Limited, Great Britain

Filed Jun. 5, 1978, Ser. No. 912,883
Int. Cl.[2] A61G 7/10; G05G 1/04
U.S. Cl. 5—81 R 7 Claims

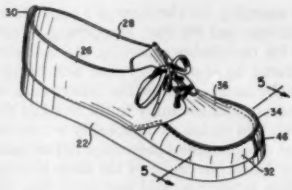


1. A patient transfer device comprising a belt connected at its ends to first and second reels and in its extension from the first reel to the second reel passing over supporting and guiding means to define in turn an upper patient supporting portion and a lower ground engaging portion, driving means for selectively rotating each of said reels so that in a first mode of operation of the transfer device with said first reel driven the belt is taken-up by the first reel and let out by the second reel, in a second mode of operation the belt is taken up by the second reel and let out by the first reel, the course of the belt over the supporting and guiding means being such that in each of the first and second modes the belt is moving in the same direction relative to the ground over its upper patient supporting portion and its lower ground engaging portion, an auxiliary belt take-up and let-out device connected to the belt at a position between its upper patient supporting portion and its lower ground engaging portion, means for selectively locking the auxiliary device to enable the first and second modes of operation to be performed, means for selectively actuating said auxiliary device and means for locking said first reel so that in a third mode of operation with said auxiliary device actuated the belt is taken up by the auxiliary device and let out by the second reel and in a fourth mode of operation in which said second reel is rotated by said driving means the belt is taken up by the second reel and let out by the auxiliary device, characterised in that the first and second reels and said auxiliary belt take-up and let-out device are provided with driving shafts to which a manually operable driving handle can be individually fitted to effect driving engagement between the handle and the shafts, and means are provided for locking said first reel and said auxiliary device against a letting-out operation, which means are selectively unlocked by the fitting of said handle to respective driving shafts for effecting a take-up operation of said second reel in said second and fourth modes of operation.

4,156,947
METHOD OF MANUFACTURING SHOES

Martin S. Nadler, 208 Alpine Dr., Paramus, N.J. 07652

Filed Oct. 11, 1977, Ser. No. 840,535
Int. Cl.[2] A43D 21/00; A43B 00/00
U.S. Cl. 12—142 R 3 Claims



1. The method of manufacturing footwear comprising the steps of:
forming a toe pocket in a footwear upper;
stitching an inner sole to the lower peripheral portion of the footwear upper with a chain stitch loose enough so that the stitched together edges of the inner sole and upper will be permitted to open up and flatten out to provide a flat surface with the inner sole substantially coplanar with the lower peripheral portion of the footwear upper;
and then forcing the now intergral stitched together upper and inner sole onto a last so that the lower peripheral portion of the upper is positioned down under the last.

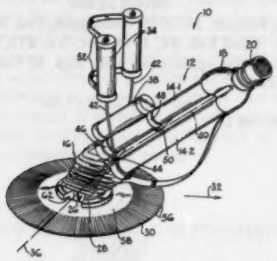
4,156,948
APPARATUS FOR CLEANING SUBMERGED SURFACES

Fernand L. O. J. Chauvier, Springs, South Africa, and Daniel J. V. D. Chauvier, 8 Hertzog Rd., Sharon Park, Dunnottar, Transvaal Province, South Africa, assignors to Daniel Jean Valere Denis Chauvier, Dunnottar, South Africa

Filed Aug. 11, 1977, Ser. No. 823,757
Claims priority, application South Africa, Aug. 19, 1976, 76/4992; Oct. 13, 1976, 76/6105; Nov. 4, 1976, 76/6618
Int. Cl.[2] E04H 3/20
U.S. Cl. 15—1.7 6 Claims

1. An apparatus for cleaning a surface angled to the horizontal and submerged in a liquid, said apparatus including
a cleaning body adapted to migrate across said surface, the top level of said liquid being defined on said surface, and
a main buoyancy member that is buoyant in said liquid, said buoyancy member being connected to said cleaning body so that said member is located beneath the top level of said liquid during use of said apparatus, said connection permitting said buoyancy member to be movable relative to said cleaning body in response to the buoyant forces which said member experiences during use and in response to the spatial orientation of said cleaning body within said liquid, said buoyancy member cooperating

with said cleaning body to aid in causing said cleaning body to retreat from the top level of said liquid when



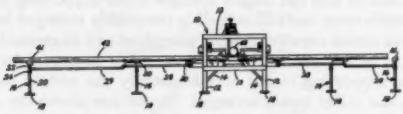
migration of said cleaning body across said surface brings said cleaning body into proximity with the top level of said liquid.

4,156,949

PIPE CLEANING MACHINE

Lynn J. Ziegelmeyer, P.O. Box 752, Shady Cove, Oreg. 97539

Filed Nov. 28, 1975, Ser. No. 635,907
Int. Cl.[2] A46B *13/02*; B08B *9/02*
U.S. Cl. 15—88 **3 Claims**



1. A machine for removing dirt and/or rust from the exterior of pipe which includes

(a) pipe supporting and guiding means;

(b) frictional, rotary pipe driving discs having marginal, deformable lateral face portions of substantial width engageable with the exterior of a pipe for rotating the pipe while scrubbing it and driving it lengthwise;

(c) driven rotary brushes engageable with the outer surface of the rotating pipe;

(d) means for adjusting said pipe driving discs to alter the number of pipe revolutions for a given extent of lengthwise feeding according to the diameter of the pipe and/or the observed need for increasing or diminishing the measure of cleaning treatment of the pipe; and

(e) motor means constructed and arranged to drive the brushes and the frictional rotary pipe driving discs,

in which the pipe supporting and guiding means is an essentially frictionless organization composed of a series of paired idler rollers, the rollers of each pair being of substantial length, divergently related, and inclined upward toward their more widely spaced ends.

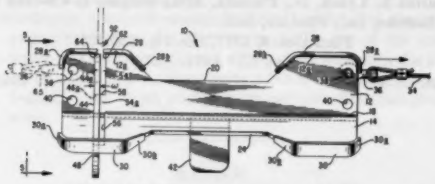
4,156,950

CULVERT CLEANOUT DEVICE

Robert C. Storrie, 215 E. Hickory, and Rufus T. Coffey, 724 Chisholm Trail, both of Denton, Tex. 76201

Filed Jan. 10, 1978, Ser. No. 868,405
Int. Cl.[2] B08B *9/02*
U.S. Cl. 15—104.3 R **10 Claims**

4. A culvert cleanout device comprising: three arms having an inner edge and an outer edge extending radially outwardly relative to a longitudinal axis formed at the intersection of the inner edge of the arms, said arms being spaced from each other; a rib secured to the outer edge of each said arms, said flat rib providing a bearing surface, attachment means secured to one end of one of the arms; and a disc having a slot formed therein adapted to be slideably disposed over one of the arms such that



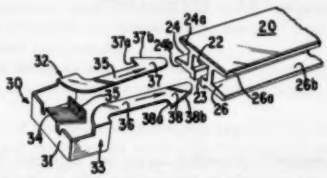
the disc extends transverse to the longitudinal axis formed by the arms.

4,156,951

WINDSHIELD WIPER BLADE UNIT AND FASTENING CLIP

Bernard C. Sharp, White Plains, N.Y., assignor to Parker-Hannifin Corporation, Shelton, Conn.

Filed Jun. 20, 1977, Ser. No. 807,834
Int. Cl.[2] B60S *1/38*
U.S. Cl. 15—250.42 **5 Claims**



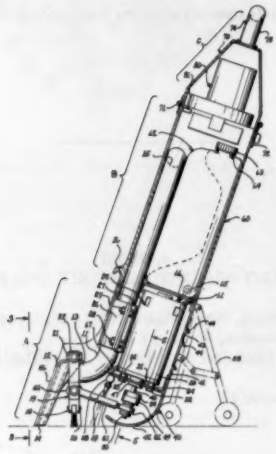
1. In a windshield wiper blade unit including an elongate backing strip of resilient material formed longitudinally with a cavity slotted along the bottom thereof for receiving slidably head and neck portions of an elastic wiper blade and having along the opposite sides thereof upper and lower lateral flanges bounding laterally open channels for slidably receiving the claws of a pressure-applying wiper blade holder, and a resilient clip secured to one end of said strip for holding said unit assembled detachably on said claws, the improvement wherein said cavity, said slot and said channels extend completely to said strip end and said clip is a unitary shaped piece of a stiff resilient material forming a base portion lying across said strip end, a footing portion extending from an upper central region of said base portion and mating to a central end portion of said strip, means fixing said footing portion to said central end portion so as to prevent removal of said clip from said strip, and resilient wing portions extending from the opposite ends of said base portion over but normally diverging away from end portions of said channels, at least one of said wing portions having a substantially flat leg extending therefrom laterally and then in the direction away from said base portion over one of said upper flanges in face to face relation thereto, each said at least one leg having thereon near its end a latch portion normally protruding laterally outside the underlying flange for engagement with one of said claws, said wing portions being convergeable elastically by pressure of a person's fingers to release each said latch portion from such engagement.

4,156,952

CARPET SOIL EXTRACTOR HAVING A POWERED BRUSH

Patrick E. Lynch, Jr., Phoenix, Ariz., assignor to Chemko Industries, Inc., Phoenix, Ariz.

Filed Oct. 4, 1977, Ser. No. 839,301
Int. Cl.[2] A47L 7/00
U.S. Cl. 15—320 29 Claims



1. A manually propelled carpet soil extractor for cleaning carpets and operable in conjunction with a source of vacuum and a source of cleaning solution under pressure, said carpet soil extractor comprising in combination:

a. a vacuum tube connected to said source of vacuum, said vacuum tube having a lower end for drawing waste water from the carpet;

b. a vacuum head attached to the lower end of said vacuum tube for vacuuming the carpet, said vacuum head including a mouth;

c. a brush for scrubbing the carpet, said brush being in general longitudinal alignment with the longitudinal axis of said mouth;

d. a pivotally depending linkage assembly suspended from the lower end of said vacuum tube for supporting said brush and imparting a reciprocating arcuate motion to said brush;

e. a motor for reciprocally pivoting said linkage assembly, said motor including a rotating output shaft, a casing and means for attaching said casing to said vacuum tube;

f. means for translating the rotary motion of said output shaft into reciprocating pivotal motion of said linkage assembly;

g. a curved spring skid for supporting, in conjunction with said vacuum head, said carpet soil extractor upon the carpet;

h. a plate secured to said casing of said motor for supporting said spring skid; and

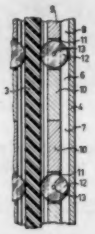
i. a nozzle assembly secured to said plate and in fluid communication with said source of cleaning fluid under pressure for spraying the carpet with cleaning solution.

4,156,953

GUIDING ARRANGEMENT FOR CLOSURE BODIES, ESPECIALLY ROLLER DOORS, ROLLER GATES, AND SHUTTERS

Kurt Alten, Ringstr. 14, 3015 Wennigsen, Fed. Rep. of Germany

Filed Feb. 14, 1978, Ser. No. 877,752
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 2706241
Int. Cl.[2] E05D 13/02
U.S. Cl. 16—96 R 8 Claims



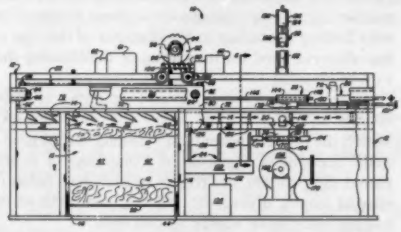
1. A guiding arrangement for vertical closure bodies, especially for roller doors, roller gates, and shutters, which includes in combination: guiding rail means of substantially U-shaped cross section with the inner surface thereof provided on both sides with groove means extending in the longitudinal direction of said rail means, multiple roller supporting means insertable from one end as well as removably arranged in said groove means capable of being assembled and disassembled in narrow space, and roller means rotatably supported by said roller supporting means at substantially the middle thereof with said roller means arranged thereon one above the other for rolling engagement with a closure body to be guided in said guiding rail means.

4,156,954

DISINTEGRATING APPARATUS

Edward C. Tibbals, Jr., 1906 Pembroke Rd., Greensboro, N.C. 27408

Filed Feb. 17, 1978, Ser. No. 878,973
Int. Cl.[2] D01G 7/06
U.S. Cl. 19—81 21 Claims



1. Apparatus for disintegrating a bale-like mass of textile strand material, said material including synthetic textile strands of large-magnitude tensile strength, comprising:

a receiving station adapted to receive the bale-like mass of strand material to be disintegrated;

outlet means spaced forwardly of said receiving station for reception of strand material withdrawn from the bale-like mass at said receiving station;

means defining an elongate passageway extending between said receiving station and said outlet means;

strand entraining means reciprocatorily movable forwardly and rearwardly along a path of travel adjacent and generally parallel to said elongate passageway for, during for-

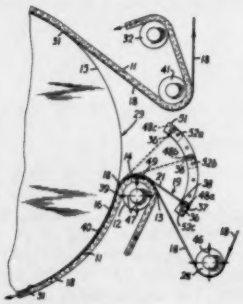
ward movement thereof, withdrawing strand material from the bale-like mass at said receiving station and transporting withdrawn strand material through said passageway to and to locations adjacent said outlet means;

and extendable and retractable strand restraining means, movable between a retracted position exteriorally of said passageway to an extended position wherein said restraining means projects into said passageway, for restraining rearward movement of withdrawn strand material back to said receiving station under the impetus of rearward movement of said entraining means.

4,156,955
METHOD AND APPARATUS FOR PRESHRINKING CLOTH

Herman J. Joy, Latham, N.Y., assignor to Cluett, Peabody & Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 598,562, Jul. 24, 1975, abandoned. This application Jun. 28, 1977, Ser. No. 810,854
Int. Cl.[2] D06C *21/00*
U.S. Cl. 26—18.6 **5 Claims**



1. An apparatus for compressively preshrinking a cloth web; the apparatus comprising in combination:

a heated drum having a drum axis, an inlet roller mounted adjacent to the drum and having an axis parallel to the drum axis,

a blanket running around an arc of the inlet roller and thence around an arc of the drum in such a manner that a first initially outer surface of the blanket stretches in passing around the arc of the inlet roller and the first surface then contracts as it passes onto the arc of the drum,

means for introducing the cloth web in a moistened condition onto the first surface of the blanket with the first surface carrying the cloth web in frictional contact therewith as at least a portion of said stretching and at least a portion of said contracting occurs;

the apparatus characterized by:

a smooth strong flexible sheet held in pressing engagement onto the cloth web on the arc of the inlet roller and extending inward of the cloth web onto the arc of the drum, the sheet being a fabric consisting of resin bonded glass fibers coated with polytetrafluoroethylene resin.

5. A method for compressively preshrinking, stabilizing and finishing a cloth web; the method comprising steps as follows:

bringing the cloth web to a moisture content which does not exceed about 40% by weight,

providing a heated drum having a drum axis, providing an inlet roller adjacent to the drum with the inlet roller having an inlet roller axis parallel to the drum axis,

running a blanket around an arc of the inlet roller and thence around an arc of the drum in such a manner that a first initially outer surface of the blanket stretches in passing around the arc of the inlet roller and the first surface then contracts as it passes onto the arc of the drum, introducing the moist cloth web onto the first surface of the blanket with the first surface carrying the cloth web in frictional contact therewith as at least a portion of said stretching and at least a portion of said contracting occurs:

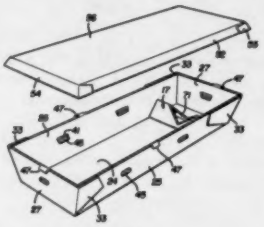
the method characterized by:

introducing a smooth strong flexible sheet held in pressing engagement onto the cloth web on the arc of the inlet roller and extending inward of the cloth web onto the arc of the drum, and the sheet being a fabric consisting of resin bonded glass fibers coated with polytetrafluoroethylene resin.

4,156,956
FOLDABLE CARDBOARD CASKET

Roger J. Partridge, Tipton, Mich., and James S. Callaway, Neopolian, Ohio, assignors to Austin A. Partridge and Viola M. Partridge, both of Tipton, Mich.

Filed Oct. 25, 1977, Ser. No. 845,005
Int. Cl.[2] A61G *17/00*
U.S. Cl. 27—4 **10 Claims**



1. In a casket including a container and a removable cover securable thereover; said container and cover comprising:

elongated container and cover blanks made of double-wall corrugated cardboards;

each blank being scored and precut to define when folded for said container and cover respectively, top and bottom walls;

upturned and downturned outwardly tapered side walls;

upturned and downturned outwardly tapered end walls;

and foldable inwardly directed flaps on all said end walls; said flaps registering with the corresponding side walls of the container and cover respectively;

a layer of adhesive material between said flaps and corresponding side walls, providing a unit assembly carton and cover;

said cover side and end walls overlying and supportably and retainingly engaging the corresponding container side and end walls;

and means interlocking said cover with said container;

said means comprising a series of formed slotted portions upon the interior of the cover side and end walls intermediate their ends forming anchor stops therein;

and a corresponding series of cover anchoring tabs extending downwardly and outwardly from the edge of said container end and side walls; snap fitted into and interlocked with said cover anchor stops respectively.

4,156,957
PROCESS FOR PRODUCING MATT SURFACED HIGHLY, FIBRILLATED WOVEN SYNTHETIC FABRIC

Alexander D. D. McKay, Dundee, Scotland, assignor to Synthetic Fabrics (Scotland) Limited, Forfar, Scotland

Filed Apr. 15, 1977, Ser. No. 787,799
Claims priority, application United Kingdom, Apr. 22, 1976, 16342/76; Nov. 2, 1976, 45528/76; Nov. 3, 1976, 45727/76
Int. Cl.[2] D05C *15/04*; D06C *19/00*
U.S. Cl. 28—159 **9 Claims**

1. A method of manufacturing a matt surfaced woven fabric having warp and weft of synthetic resinous material, each warp and weft being substantially totally fibrillated and com-

prising a flat bundle of fibrils, substantially all the fibrils in each warp and weft being joined together in the form of a random network and the surface of the woven fabric being substantially free of surface hairiness, which includes the step, after weaving a woven fabric having warp and weft tapes of synthetic resinous material, of substantially totally fibrillating the warp and weft tapes by repeated needling to subject each

square centimeter thereof to at least 800 needle penetrations using smooth needles of rounded cross-section so that the warp and weft tapes are each broken down into a multiplicity of fibrils which are joined together in the form of a random network, the fibrillated fabric having warp and weft each of which comprises a flat bundle of fibrils and the fibrillated woven fabric being substantially free of surface hairiness.

4,156,958

RELEASABLE FASTENING

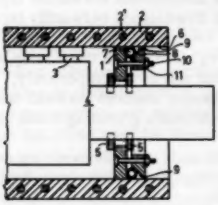
Hans Miesch, Zurich, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Nov. 23, 1977, Ser. No. 854,347

Claims priority, application Switzerland, Nov. 30, 1976, 15033/76

Int. Cl.² B21B *13/02*

U.S. Cl. 29—116 AD **8 Claims**



1. A releasable fastening for attaching an annular body to an elastic roll shell which has a comparable diameter and with a peripheral surface of which an end face of the body forms a corner which extends circumferentially around the axis of the shell, the fastening comprising

a. a coil spring in the form of a ring located in said corner and having convolutions which bear directly on said peripheral surface of the shell and are compression resistant;

b. wedging means carried by the annular body and having wedging surface means which abuts the convolutions of the spring ring and is inclined with respect to the shell axis; and

c. screw threaded pressing means reacting between the annular body and the wedging means and serving to force the wedging means axially toward said end face of the body and cause the wedging surface means to press the convolutions axially against said end face of the body and radially against said peripheral surface of the shell,

d. whereby the convolutions apply a multitude of uniform gripping forces which secure the shell to the annular body without distorting the shell or impairing concentricity between the shell and the body.

4,156,959

EXPANDER DEVICE

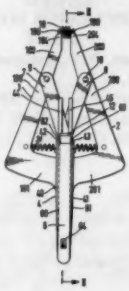
August Weisenburger, Sophienstrasse 6, D 6 Frankfurt 90, Fed. Rep. of Germany

Filed Dec. 17, 1975, Ser. No. 641,700

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1974, 2461003

Int. Cl.² B23P *19/08*

U.S. Cl. 29—225 **35 Claims**



1. A device of the character described, particularly for stressing springs, piston rings, circlips and similar objects, comprising a support member; an actuating member mounted on said support member for pivoting about an axis; a pair of jaws mounted on said support member, at least one of said jaws being pivotable relative to said support member, said jaws having respective free end portions adapted to engage an object to be stressed; and transmission means interposed between said actuating member and at least said one jaw and being operative for pivoting the latter relative to said support member and the other jaw in response to pivoting of said actuating member so as to apply stressing forces to the object, including a ratchet mechanism actuated by said actuating member, and at least one connecting link extending between and pivoted to said ratchet mechanism and said one jaw, said ratchet mechanism including a rack having a plurality of detent teeth, means for mounting said rack on said support member for translatory displacement longitudinally thereof, and a pawl connected to said actuating member for movement therewith into and out of engagement with said detent teeth to thereby displace said rack in a predetermined direction.

4,156,960

METHOD OF MANUFACTING A WIRE PRINTER HEAD

Yoshiaki Ikeda, Tokyo, Japan, assignor to Kabushiki Kaisha Seikosha, Japan

Filed Feb. 22, 1978, Ser. No. 880,143

Claims priority, application Japan, Feb. 28, 1977, 52-21313; Feb. 28, 1977, 52-21314

Int. Cl.² B23P *19/00*

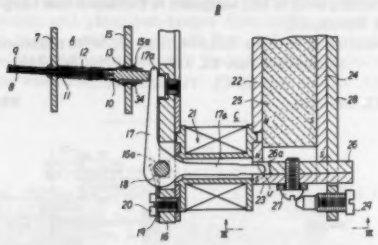
U.S. Cl. 29—426 **7 Claims**

1. A method for manufacturing a wire printer head which comprises:

providing; a wire guide block comprising, a print wire, a hilt connected to the rear end portion of said print wire, a guide tube for said print wire, a return spring for pushing said hilt rearward, a guide pipe for said hilt and a support plate provided with a hole in which said guide pipe loosely fits, and a wire driving block comprising, a lever for impacting said hilt, and an electromagnetic driving means for actuating said lever:

connecting said wire guide block to said wire driving block with said hilt directly contacting said lever:

contacting said guide pipe to said hilt by a pushing means whose force is weaker than that of said return spring: and



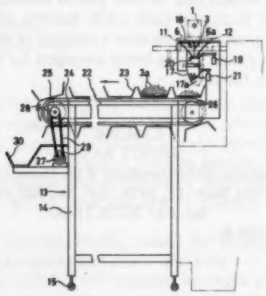
spreading adhesive agent to the engaged portion between said guide pipe and said hole thereby fixing said guide pipe to said support plate in said hole.

4,156,961

WIRE COLLECTING APPARATUS FOR USE WITH WIRE CUTTING AND INSULATION STRIPPING MACHINE

Hitoshi Agoh, Kawanishi, Japan, assignor to Shin Meiwa Industry Co., Ltd., Nishinomiya, Japan

Filed May 17, 1978, Ser. No. 906,833
Int. Cl.[2] B21F *21/00*
U.S. Cl. 29—566.3 **26 Claims**



1. A long-sized wire collecting apparatus to be installed in connection with an automatic insulated wire cutting and insulation stripping machine which comprises:

cutter assemblies including a pair of opposed wire cutting blades, pairs of opposed insulation cutting blades disposed on opposite sides of said pair of wire cutting blades, and means for holding said pairs of cutting blades so that they can be opened and closed,

a movable clamp device including clamp parts which can be opened and closed, and adapted to be reciprocated longitudinally of wires for withdrawing wires whose insulations are to be stripped and for stripping insulation strips, and

a slide bar for slidably supporting said movable clamp device so that the latter can be reciprocated,

said apparatus comprising:

a first wire storing device disposed immediately below the path of reciprocating motion of said movable clamp device, including guide means for linearly correcting wires withdrawn by said movable clamp device, first receptacle means for temporarily storing at least a wire length cut by a single closing operation of said cutter assemblies and having a first bottom member which can be opened and closed, and first control means for controlling said first bottom member so as to open and close the latter a little after the start of the opening of said cutter assemblies subsequent to the cutting of wires by the closing of the cutter assemblies,

a second wire storing device disposed immediately below said first wire storing device, including second receptacle means having the capacity for storing cut wire lengths obtained by at least a plurality of closing operations of said cutter assemblies, and a second bottom member which can be opened and closed, and second control means for controlling said second bottom member so as to open the latter once for every predetermined number of times of cutting, and

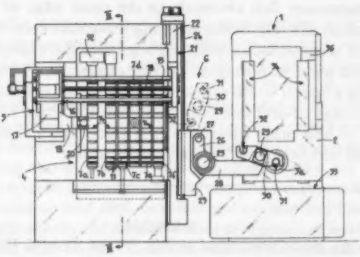
wire collecting means disposed immediately below said second wire storing device and having the capacity for storing a plurality of cut wire lengths once stored at least in said second wire storing device.

4,156,962

TOOL CHANGING INSTALLATION FOR AUTOMATIC MACHINE-TOOL

Friedrich Haller, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to Dixi S.A. Usine 2, Neuchatel, Switzerland

Filed Mar. 30, 1977, Ser. No. 782,628
Claims priority, application Switzerland, Apr. 7, 1976, 4336/76
Int. Cl.[2] B23Q *3/157*
U.S. Cl. 29—568 **10 Claims**



1. An improved tool changing installation for an automatic machine-tool, including a tool magazine and a transporting mechanism for removing the tools from the machine and replacing them in the magazine, the improvement comprising:

said magazine including a plurality of rotatable coaxial drums including means for rotating said drums independently from one another, said tools being angularly distributed around the periphery of each drum, each drum being provided with a radial recess opening on its periphery larger than the width of said tools to allow movement of a tool therethrough;

said transporting mechanism including gripping means movable on an axis substantially parallel with the axis of said drums for removing and replacing tools in said drums, said gripping means carrying a tool aligned such that it will pass through said recess openings in the other drums as it is moved past said drums.

4,156,963

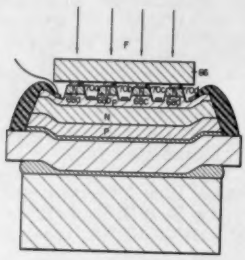
METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE

Isamu Tsuji; Nobuo Itazu, both of Yokohama, and Katsuhiko Takigami, Yamato, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 22, 1977, Ser. No. 863,445
Claims priority, application Japan, Dec. 28, 1976, 51-157352
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—581 **5 Claims**

1. A method for manufacturing a mesa type semiconductor device which is used under pressure applied between an anode terminal plate and a cathode terminal plate and which includes

a semiconductor body having an outer layer divided into a plurality of outer portions, the method comprising steps of: preparing a semiconductor body having two outer layers one of which is divided into a plurality of outer layer portions, each of said outer layer portions being provided with a first electrode and the other outer layer being provided with a second electrode; providing a support plate for the resultant structure in such a manner that said second electrode comes in contact with one surface of said support plate; mounting a first terminal plate on the other surface of said support plate by means of



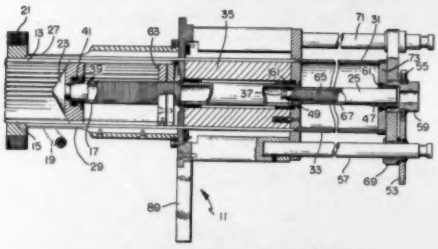
solder means; disposing on said first electrodes a flat plate having a lateral width covering at least from the outer edge of one outermost first electrode to the outer edge of the other outermost first electrode; applying a pressure from outside on to said semiconductor body through said flat plate; removing said flat plate; disposing on the first electrodes a pressing plate having a lateral width smaller than a distance ranging from the outer edge of said one outermost first electrode to the outer edge of said other outermost first electrode; and disposing a second terminal plate on the pressing plate.

4,156,964

COIL PLACING MACHINE WITH STACK HEIGHT ADJUSTMENT

Robert G. Walker, Ossian, and Andrew K. Anspach, Bluffton, both of Ind., assignors to Industra Products, Inc., Fort Wayne, Ind.

Filed Mar. 23, 1978, Ser. No. 889,200
Int. Cl.[2] H02K *15/10*
U.S. Cl. 29—734 **26 Claims**



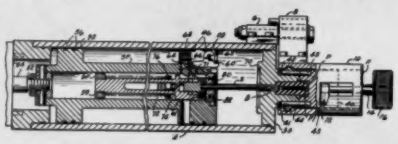
1. In a coil placing machine having a plurality of generally parallel upstanding finger elements supported on a shaft and disposed generally in a circular pattern for supporting coils and a magnetic core into which the coils are to be placed, and a reciprocable ram actuated stripper movable along the finger elements to engage and move the coils into the magnetic core, the improvement comprising means effective only in one stripper position for mechanically coupling the finger support shaft and stripper actuating ram together to prevent relative rotation therebetween.

4,156,965

SEMI-AUTOMATIC CONTACT INSERTION TOOL

Bruno C. Buszkiewicz, Chicago, and Joseph A. Storcel, North Riverside, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 722,674, Sep. 13, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,945
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—754 **14 Claims**



1. A machine for use in loading contacts into contact receiving bores of a connector body comprising adapter means for receiving and retaining a connector body having a contact receiving bore, locking means for securing a connector body in the adapter means,

bore enlarging means including a body and a shell, first piston means for supporting said body, second piston means for supporting said shell, said first and second piston means cooperating for aligning said body coaxially within said shell and for simultaneously pushing said body and said shell into a contact receiving bore for gently enlarging the bore, said first piston means being slidably mounted within said second piston means for retracting said body from said shell while leaving said shell in the bore in a position to receive a contact in the bore, and

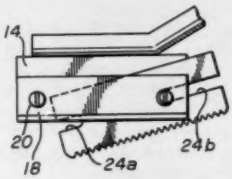
said second piston means being arranged for retracting said shell from the bore.

4,156,966

GROUT SAW

William J. Eubank, 6833 Beechnut #14, Houston, Tex. 77074

Filed Mar. 13, 1978, Ser. No. 885,900
Int. Cl.[2] B27B *21/00*
U.S. Cl. 30—166 R **9 Claims**



1. A tool comprising:

(a) base means including a plate with a plate first surface bounded, in part, by a plate leading edge;

(b) keeper means, including a keeper first surface bounded, in part, by a keeper leading edge;

(c) first and second fastening means, each such fastening means including a shaft, and for connecting said keeper means to said base means with said keeper means oriented relative to said plate such that said keeper first surface faces said plate first surface and such that said keeper leading edge and said plate leading edge are generally directed toward the same direction; and

(d) a blade including a blade cutting edge and first and second slots such that, with said keeper means so connected to said base means by said first and second fastening means, said blade may be inserted, or removed from, between said plate first surface and said keeper first sur-

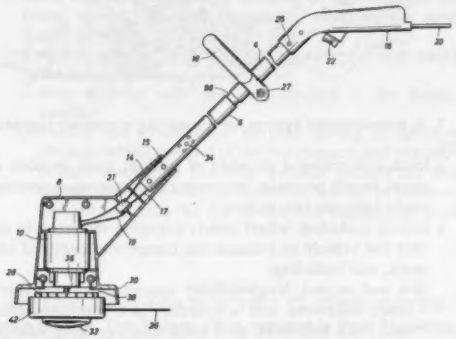
face, with said first fastening means shaft passing through said first slot and said second fastening means shaft passing through said second slot, and such that, with said blade so between said plate and keeper first surfaces, said plate, said keeper means, and said first and second fastening means cooperate to hold said blade with said blade cutting edge extending beyond said plate and keeper leading edges.

4,156,967

ROTARY CUTTING ASSEMBLY

George C. Ballas, Sr., Houston, Tex., assignor to Weed Eater, Inc., Houston, Tex.

Filed Dec. 2, 1976, Ser. No. 746,685
Int. Cl.[2] A01D *55/18*
U.S. Cl. 30—276 5 Claims



1. Apparatus for cutting vegetation and the like comprising:

Head means rotatable in a cutting plane and having a concentrically located spool-like storage portion and a peripherally located support portion having a curvilinear bearing surface in and substantially perpendicular to said plane and spaced from the axis of rotation of said head means,

electrically actuated driving means for rotating said head means in said plane and about said axis,

a flexible non-metallic line member having a portion coiled in said storage portion of said head means and further having an uncoiled portion initially extending tangentially from said coiled portion in said cutting plane to and across said bearing surface and further continuing radially outwardly from the periphery of said head means,

a housing supporting and enclosing said driving means,

tubular handle means attached at one end to said housing and including a switch associated with a handle at the other end,

said tubular handle means including first and second sections and means for movably and telescopically mounting said first section within said second section, said means maintaining coaxial alignment of said first and second sections, said second section carrying said handle and said first section adapted to provide a second handgrip for the user's hands,

stop means for limiting outward axial movement of said first section from said second section,

biasing means for urging said first section from said second section until axial movement is limited by said stop means,

said stop means comprising longitudinally interfitting slots and pins on said first section and second section whereby said first section and said second section are held securely in a first angular position,

said slots and interfitting pins arranged to provide at least two angular positions between said first section and said second section, and said slots and pins being disengaged by inward axial movement of said first section into said second section whereby said first section is rotatable in said second section to another angular position, and said biasing means urge said first section outwardly from said second sections wherein said slots and pins interfit to secure said first and second sections in the selected angular position, and

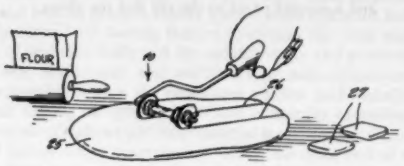
an electrical harness assembly including a rectifier connected between said switch and said driving means for actuating said driving means.

4,156,968

GEM COOKIE CUTTER

Mary J. Gould, and James O. Gould, both of 10891 Blatt Rd., North Jackson, Ohio 44451

Filed Jul. 5, 1978, Ser. No. 921,958
Int. Cl.[2] B26B *3/00*
U.S. Cl. 30—307 2 Claims



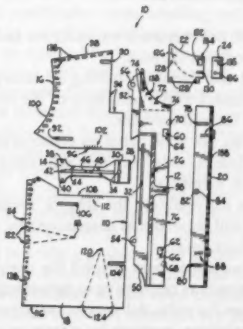
1. A cookie cutter, comprising, in combination, a handle unit, a pair of spaced-apart wheels fitted on said unit, so that said wheels can be rolled across dough, in order to cut said dough into strips of uniform width; said handle unit including a handle, from one end of which a configurated shaft extends, said shaft including a terminal end portion that extends at right angles to a longitudinal axis of said handle, said terminal end portion being screw-threaded, and engaging a wing nut that retains said wheels upon said terminal end portion of said shaft; a spacer sleeve on said shaft terminal end portion and located between said wheels, and a plain washer positioned adjacent an outer side of said wheels; each said wheel comprising a thin disc and a hub on one side thereof, whereby reverse placement of either or both said wheels on said shaft terminal end portion changes a distance between said discs.

4,156,969

GARMENT DESIGNING AID

Fred W. K. R. Werber, 29 Schaumans-kamp, Reinbeck, Hamburg, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,668
Claims priority, application United Kingdom, Nov. 19, 1976, 48456/76; South Africa, Mar. 9, 1977, 77/1434
Int. Cl.[2] A41H *3/015*
U.S. Cl. 33—14 8 Claims



1. A bodice design aid for assisting a person in providing

patterns for a bodice of different designs, of various sizes, the design aid including:

a rigid spine having an upper end shaped to provide a neck opening;

a rigid rib projecting outwardly at right angles from the spine to define an upper quadrant on one side of the rib and a lower quadrant on the other side of the rib and adjustably displaceable longitudinally along the spine;

a plurality of first panels of different designs, one of which is selected and detachably secured to the rib and to the spine to fill the first quadrant;

a plurality of second panels of different designs, one of which is selected and detachably secured to the rib and to the spine to fill the second quadrant; said first and second panels being adjustably displaceable laterally with respect to the spine and the rib; and

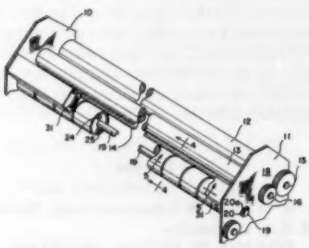
securing means for detachably securing the said first panel and a second panel to the rib and the spine.

4,156,970

APPARATUS FOR AREA MEASUREMENT OF ELONGATED STRIPS

Henry F. Hope, and Stephen F. Hope, both of 2421 Wyandotte Rd., Willow Grove, Pa. 19090

Filed Aug. 12, 1977, Ser. No. 823,986
Int. Cl.[2] G01B *7/32*
U.S. Cl. 33—123 **6 Claims**



1. Apparatus for measurement of area of elongated strips and sheets of different width which comprises

positive strip feeding members for delivery of strips and sheets to be measured,

a shaft,

a plurality of roll members mounted on said shaft for independent rotation thereon,

each of said roll members having an activating portion in close proximity to the periphery of the roll member movable with the roll member,

said activating portions being so constructed and arranged to avoid interference between activating portions in adjoining roll members,

guide means for retaining the strip or sheet in engagement with said roll members as determined by the width of the strip or sheet, and

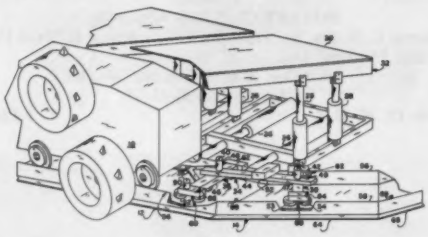
fixedly mounted members beyond the periphery of each of said roll members responsive to movement of said activating portions for pulse delivery upon respective movement of said activating portions by a strip or sheet in engagement with said roll members as determined by the strip or sheet length and width.

4,156,971

CONTOUR MEASUREMENT SYSTEM

James R. Currie; Ralph R. Kissel; Emsley T. Deaton, Jr., and Richard A. Campbell, all of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 3, 1977, Ser. No. 848,418
Int. Cl.[2] G01B *5/24, 7/30;* **E21C** *35/08*
U.S. Cl. 33—174 L **5 Claims**



1. A measurement system for measuring a contour comprising:

a track comprising a plurality of straight track sections of equal length pivotally interconnected to extend continuously between two points;

a vehicle including wheel means engaging the track to enable the vehicle to traverse the composite length of said track, and including:

first and second, longitudinally spaced along said track, track followers, and a reference arm interconnecting said track followers, each track follower being adapted to contact and align with a different one of said track sections, and

angular detection means coupled between said first and second track followers for providing as an output a signal representative of the sum of the angles between said reference arm and said track followers; and

position detection means for providing a position identifying output signal of a position of said vehicle along said inteconnected tracks, and including means for providing at least one such position identifying signal when said first track follower is in engagement with one said track, and said second track follower is in engagement with an adjoining said track, whereby at least one output of said angular detection means may be identified as being representative of the angle between each pair of adjoining said tracks.

4,156,972

HITCH ALIGNMENT DEVICE AND METHOD

James A. Vankrevelen, 4041 Plymouth Dr., Muskegon, Mich. 49441

Filed Jan. 18, 1978, Ser. No. 870,424
Int. Cl.[2] G01C *5/00*
U.S. Cl. 33—264 **11 Claims**

1. A guide device having two components for aligning first and second engageable hitch members mounted respectively on a vehicle and a trailer, one component includes a first frame mountable on the first engageable member and the second

component includes a second frame mountable on the second engageable member; the improvement comprising:

strap means connected to the first frame and sized to wrap about the first engageable member to tightly strap the frame against the first engageable member;

a base plate having a substantially planar surface and connected to the first frame for abutting the first engageable member at the substantially planar surface; and

a first adjustable means for mounting the base plate to the first frame for adjustment along a length thereof and for angular adjustment about a longitudinal axis thereof.

10. A guide device having two components for aligning first and second engageable hitch members mounted respectively on a vehicle and a trailer, one component includes a first frame including a rod mountable on the first engageable member and the second component includes a second frame mountable on the second engageable member; the improvement comprising:

strap means connected to the first frame and sized to wrap about the first engageable member to tightly strap the frame against the first engageable member, the strap means includes:

a washer member with a central aperture through which the rod extends;

a strap member with one end attached to the washer member;

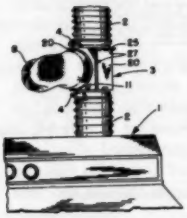
the other end of the strap member having an aperture through which one end of the rod extends; and whereby tension exerted by the strap member around the first engageable hitch member locks the washer in place on the rod and fixes the rod to the first engageable hitch member.

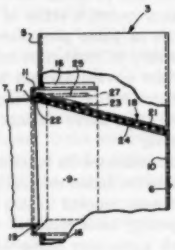
4,156,973

HEATING VENT FOR ELECTRIC CLOTHES DRYER

James D. Bede, Bay Village, Ohio, assignor to Bede Industries, Inc., Cleveland, Ohio

Filed Oct. 5, 1977, Ser. No. 839,572
Int. Cl.[2] F26B *19/00;* F16K *1/16*
U.S. Cl. 34—86 **3 Claims**





1. A heating vent for a clothes dryer comprising a housing adapted to be interposed in the dryer vent hose; said housing having a passage for outdoor venting of the dryer exhaust through said vent hose, and having a lateral outlet passage for indoor venting of the dryer exhaust; a valve member pivotally connected in said housing for selective positioning to close said outlet passage for outdoor venting through said vent hose and housing passage or to close the downstream end of said housing passage for indoor venting of the dryer exhaust from the upstream end of said passage through said outlet passage; said valve member having operating means therefor located exteriorly of said housing and extending radially from the pivot axis of said valve member alongside one side of said housing; said operating means and housing having cooperating detent means to releasably lock said valve member in the aforesaid positions while resiliently biasing said valve member to the respective positions; said housing comprising a main housing part of lightweight sheet material sheared and bent to provide tubular nipples at its opposite ends with circumferentially overlapping ends secured together for clamping of the end portions of the vent hose thereto and to provide an intermediate semi-cylindrical wall coaxial with and of the same diameter as said nipples and parallel side walls tangent to said semi-cylindrical wall; a laterally extending housing part of lightweight sheet material sheared and bent to provide axially spaced apart end walls and a radially outer wall having flanges overlying the axial end portions of said side walls and the radially outer end portions of said side walls; said end walls having semi-cylindrical flanges extending within the respective nipples; said radially outer wall having an opening in which a laterally extending tubular nipple of lightweight strip material is secured to constitute said lateral outlet passage over which the open end of a sock-like filter is adapted to be stretched; said operating means comprising a rod pivotally engaged in openings in opposite sides of said housing adjacent the junction of said radially outer wall with one end wall and having an intermediate offset portion secured to said valve member for swinging of the latter in response to pivoting of said rod; said rod being bent to extend alongside one side of said housing and terminating in an end portion yieldably engaging said one side of said housing; said detent means comprising angularly spaced-apart recesses in said one side of said housing into which said end portion of said rod resiliently snaps to lock said valve member in the respective housing passage and outlet passage closing positions; the angular spacing of said recesses being greater than the angle of swinging of said valve member from one position to the other whereby a torque load on said row resiliently biases said valve member to the respective positions.

4,156,974

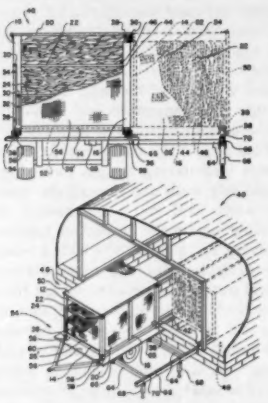
COMBINATION PLANT SEEDLING-BULK TOBACCO SUPPORT STRUCTURE

Barney K. Huang, 2008 Varnell Ave., Raleigh, N.C.

Continuation-in-part of Ser. No. 698,462, Jun. 21, 1976, abandoned. This application Mar. 24, 1978, Ser. No. 889,746
Int. Cl.[2] A24B *1/06;* F26B *25/06*
U.S. Cl. 34—236 **9 Claims**

1. A combination plant seedling and bulk tobacco support structure adapted to support plant seedlings in one mode of operation and to support a volume of tobacco in another mode of operation, said combination plant seedling and bulk tobacco support structure in said plant seedling support mode of operation comprising: an upstanding frame structure; screen means operatively associated with said frame structure and including a plurality of independent screens normally vertically spaced within said frame structure for supporting plant seedlings at several levels within said frame structure; means associated with said frame structure of said combination support structure for supporting said screens at selected levels within said frame structure such that in the plant seedling support mode, said frame structure is adapted to support multi-layers of plant seedlings; and wherein as used as a bulk tobacco support structure and disposed in a filling position, said screen means of said combination support structure being movable from an open position to a closed position; in said open position said screen means being positioned such that tobacco may be filled below the normal level occupied by a respective screen of said screen means when said respective screen is disposed in said closed

position, and wherein in said closed position said screen means is adapted to be positioned over a layer of tobacco filled within said combination support structure and in said closed position said screen means functions to overlay that layer of tobacco underlying said screen means when in the normal filling position; mounting means associated with said screen means for mounting said screen means in said support structure such that respective screens can be moved rectilinear in said support structure when used as a tobacco support structure; and wherein said support structure includes biasing means adapted to be connected to said screen means for biasing individual



screens of said screen means in one direction during the curing and drying operation in order to provide a more uniform body of tobacco material, and wherein said screen means extends generally transversely across said combination support structure in said closed position when said combination support structure is disposed in said filling position and wherein said combination support structure is rotated approximately 90 degrees from said filling position to a curing and drying position such that in said curing and drying position said combination support structure includes a plurality of side-by-side columns of tobacco leaves separated by the then vertically disposed and spring biased screen means.

4,156,975

VISUAL AID AND DISPLAY DEVICE

Douglas E. Harding, Shollond Hill, Nacton, Ipswich IP10 OEW, England

Filed Jan. 16, 1978, Ser. No. 870,037

Claims priority, application United Kingdom, Jun. 23, 1977, 26343/77

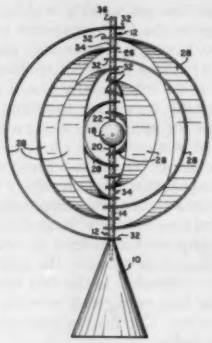
Int. Cl.[2] G09B *1/00*

U.S. Cl. 35—1 **10 Claims**

1. A visual display device, comprising:

an axis;

a plurality of vanes varying in length connected to said axis, each of said vanes being a sheet-like member substantially longer in length than in width and concaved towards said axis and connected to said axis at locations adjacent each of the ends of said vanes, the points on said axis at which one of said vanes is connected to said axis being located



between the points on said axis at which the next longest of said vanes is connected; and

each of said vanes having a visual display thereon.

4,156,976

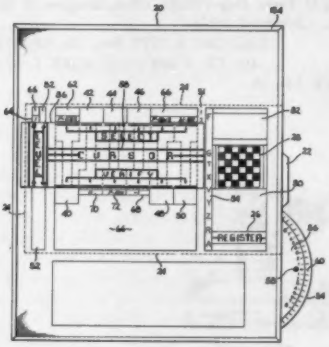
GAME PLAYING APPARATUS

Norbert K. Mikun, 17527 Antonio Ave., Cerritos, Calif. 90701

Filed Feb. 16, 1978, Ser. No. 878,311

Int. Cl.[2] G09B *19/22*

U.S. Cl. 35—8 R **16 Claims**



1. Game playing apparatus comprising:

at least one program card having arranged thereon, in a logical order, a series of game play moves, each of the series of game play moves having associated with it a plurality of distinctive move choices, said program card further having a merit notation for each of said move choices indicative of the relative merit of each of the distinctive move choices within each of the game play moves;

a frame structure for receiving each of said program cards in a predetermined orientation;

first means coupled to said frame structure for sequentially exposing each plurality of distinctive move choices of each game play move without exposing the merit notations for any of the respective plurality of distinctive move choices; and

second means coupled to said frame structure for selectively exposing individual merit notations each corresponding to one selected move choice from the plurality of distinctive move choices.

4,156,977

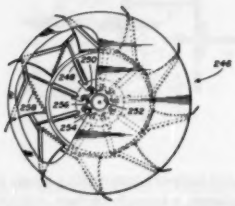
CONVEYOR FOLDING AND MOLDBOARD OPERATION FOR EXCAVATING AND LOADING SYSTEMS

Charles R. Satterwhite, Dallas, Tex., assignor to Unit Rig & Equipment Co., Tulsa, Okla.

Division of Ser. No. 745,860, Nov. 29, 1976, which is a division of Ser. No. 660,515, Feb. 23, 1976, Pat. No. 4,063,375, which is a continuation of Ser. No. 554,671, Mar. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 400,043, Sep. 24, 1973, Pat. No. 3,897,109, which is a continuation-in-part of Ser. No. 238,089, Mar. 28, 1972, abandoned. This application May 10, 1978, Ser. No. 904,384

Int. Cl.[2] E02F *3/24*

U.S. Cl. 37—190 1 Claim



1. An excavating wheel comprising:

a pair of spaced apart side plates mounted for rotation about and each extending radially outwardly with respect to a central axis of rotation;

a plurality of stationary walls each extending between the side plates and each having outwardly projecting material cutting means;

said stationary walls being stationary with respect to the side plates;

a plurality of movable walls each extending between the side plates for cooperation with one of the stationary walls to define a digging bucket;

said plurality of stationary walls and said plurality of movable walls cooperating with the side plates to define a plurality of digging buckets positioned immediately adjacent one another about the entire periphery of the excavating wheel;

each of said movable walls being supported by the side plates for pivotal movement between a material receiving position and a material dumping position;

means entirely enclosed by the digging buckets and the side plates and responsive to rotation of the excavating wheel for positively pivoting the movable wall of each digging bucket to the material receiving position during one portion of said rotation and for positively pivoting the movable wall of each digging bucket to the material dumping position during another portion of said rotation; and

said means for positively pivoting the movable wall of each digging bucket comprising:

a plurality of push rods each connected at one end to the movable wall of one of the buckets;

a rigid collar interconnected to the ends of the push rods remote from the movable walls; and

means rotatably supporting the collar at a point offset from the rotational axis of the excavating wheel so that the push rods and the collar cooperate to positively pivot the movable walls of the buckets between their material receiving and material dumping positions.

4,156,978

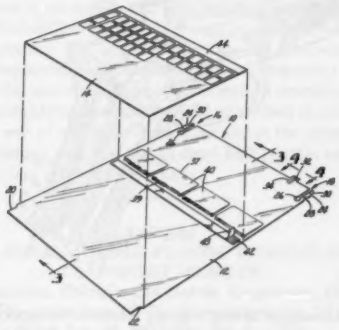
MICROFICHE CARRIER

William R. Swift, Placentia, and Clyde E. Le Fevre, Orange, both of Calif., assignors to AM International, Inc., Los Angeles, Calif.

Filed Oct. 14, 1977, Ser. No. 842,156

Int. Cl.[2] G09F *1/10*

U.S. Cl. 40—158 B 8 Claims



1. A microfiche carrier, comprising:

a sheet of flexible transparent material having a first and a second surface defining a carrier;

a plurality of ramp means on the first surface of the carrier to prevent edge interference with adjacent carriers in response to retrieval of a selected microfiche carrier from a deck of microfiche carriers in a suitable magazine, each said ramp means extending at an incline from a front edge of the ramp means flush with the first surface to a rear edge of the ramp means raised above the first surface; and

a strip of adhesive means on the first surface adjacent to the rear edges of the ramp means and parallel thereto for securing a microfiche thereto.

4,156,979

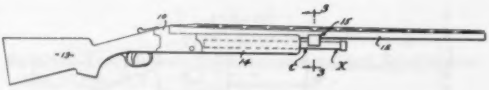
GUN RECOIL DAMPER

Philip K. Katsenes, 630 Idaho Ave., Apt. 201, Santa Monica, Calif. 90403

Filed Feb. 27, 1978, Ser. No. 881,588

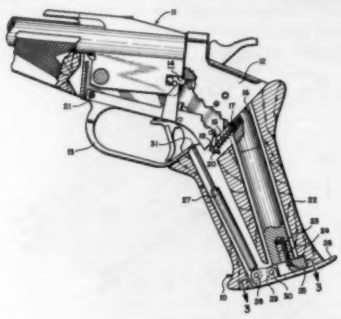
Int. Cl.[2] F41C *27/00*

U.S. Cl. 42—1 V 6 Claims



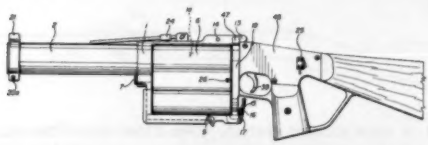
1. A recoil damper operable when a load leaves the muzzle of a gun barrel, and including; a cylinder juxtaposed to and on an axis parallel with the gun barrel axis, the rear end of the cylinder being closed, there being ports opening into the cylinder and gun barrel intermediate their ends respectively and with an open passage therebetween, an inertial piston body slideable in the cylinder from a normally retracted rearmost position, there being a passage through the piston body and opening therefrom through a circumferential channel aligned with the cylinder port when the piston body is retracted, forward movement of the piston body closing the cylinder port for subsequent expansion of gases passed thereby, and a damper means carried by the front of the cylinder yieldingly resisting forward movement of the piston body and returning the same to its normally retracted rearmost position after the gun is fired.

4,156,980
BREECH OPENING APPARATUS FOR HANDGUN
John E. Aspenwall, 1327 E. Madrid Way, Sandy, Utah 84070
Filed Jan. 20, 1978, Ser. No. 870,866
Int. Cl.[2] F41C *11/08*
U.S. Cl. 42—44 5 Claims



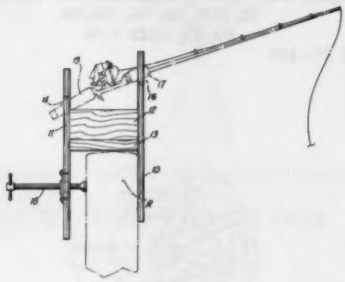
1. In a handgun having a spring biased breech locking mechanism, breech, receiver and pistol grip handle, the improvement comprising a butt-mounted release lever assembly including:
   a. a base member positioned at the butt of said handle;
   b. linkage means attached to the base member near the butt location of said handle;
   c. lever means having a first pivotal point of attachment for coupling to said linkage means intermediate to the length of said lever means;
   d. a connecting rod having means for attachment at one end thereof to said lever means, the other end of said rod being engaged in contact with said spring biased breech locking mechanism at a contact point such that displacement of said lever extends the connecting rod and breech locking mechanism, thereby releasing said breech.

4,156,981
REVOLVER-TYPE REPEATING GUN
Norman E. Lusk, Seeleys Bay, Canada, assignor to Her Majesty the Queen in right of Canada, Canada
Filed Sep. 9, 1977, Ser. No. 831,966
Claims priority, application Canada, Oct. 20, 1976, 263776
Int. Cl.[2] F41C *1/02*
U.S. Cl. 42—63 9 Claims



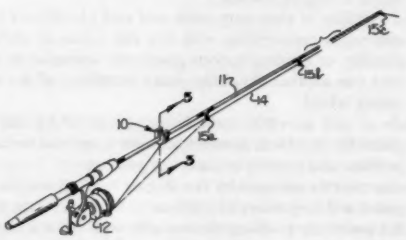
1. A conversion unit for use in converting a weapon of single-shot capability, to one of multiple shot capability, said single shot weapon having a barrel to be removed and discarded and a stock and firing means to be modified for use with said conversion unit, said conversion unit comprising a barrel, a breech frame on which the barrel is mounted, and means for connecting the conversion unit to said stock and firing means, said breech frame when connected to said modified stock and firing means defining a lateral opening through opposite sides of the frame for receiving a magazine having a plurality of chambers to accommodate relatively large calibre projectiles, said magazine being rotatably mounted in said opening and being adapted to be rotatably advanced in such a manner that the chambers are successively brought into a firing position in alignment with the barrel.

4,156,982
SUPPORT FOR FISHING ROD
Lewis Phillips, Jr., 398 Dollar Mill Ct. SW., Atlanta, Ga. 30331
Filed Nov. 21, 1977, Ser. No. 853,293
Int. Cl.[2] A01K *97/10*
U.S. Cl. 43—21.2 6 Claims



1. A fishing rod support comprising a pair of spaced substantially parallel plates, a trough section extending between and rigidly interconnecting said plates with the plate extending above and below and trough section in spaced relationship, and each plate forming an end closing an end of said trough and having opening means therein above the trough section to receive and support a fishing rod, the trough section being adapted to receive fishing accessories.

4,156,983
FISHING LINE TENSIONING DEVICE
Harry O. Moore, Charlotte, N.C., assignor to William C. Cribbs, Charlotte, N.C., a part interest
Filed Jan. 11, 1978, Ser. No. 868,514
Int. Cl.[2] A01K *87/00*
U.S. Cl. 43—25 2 Claims



1. A device for mounting on a fishing rod to tension fishing line as the line is being wound on a reel, said device comprising:
   a body having an opening therethrough for receiving a fishing rod, said body having a peripheral recess extending transversely of and partially encircling said opening;
   means for securing said body to a fishing rod; and
   a resilient wire fastened at one end thereof to said body and at least in part extending within the peripheral recess, said wire having a coil formed therein adjacent said end allowing for a flexing of the wire outwardly from said body, whereby a fishing line positioned between said resilient wire and said body will have a snubbing action imparted thereto to provide tension to the fishing line as the same is

being wound upon a reel and a sudden force applied to the fishing line will free it from the snubbing action.

4,156,984

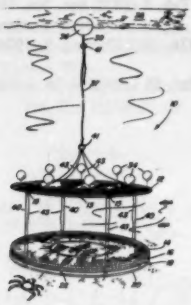
MARINE LIFE TRAP

Warren H. Kinser, Sr., P.O. Box 1726, Kodiak, Ak. 99165

Continuation-in-part of Ser. No. 636,588, Dec. 1, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,795

Int. Cl.[2] A01K *69/10*

U.S. Cl. 43—105 **55 Claims**



1. A trap for marine life and the like comprising: a top planar enclosure means, a bottom planar enclosure means, guiding means for connecting the top enclosure means with the bottom enclosure means, and side enclosure means associated with the guiding means and mounted for movement between a position wherein the sides of the trap are open and a position where the sides are enclosed, means connected to the side enclosure means to move it to closed position from a remote location when lifting the trap and retain it in closed position, said guiding means including a plurality of outer guide members spaced around the outside of said top planar enclosure means, likewise spaced around the outside of said bottom planar enclosure means, and enclosing the side enclosure means therewithin to prevent any substantial lateral displacement thereof.

4,156,985

PNEUMATIC DOLL

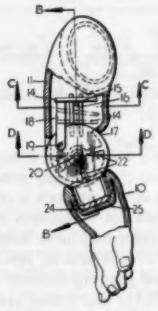
Peter Viner, the Chase, England, assignor to General Mills U.K. Limited, Wetherby, England

Filed Sep. 27, 1977, Ser. No. 837,327

Claims priority, application United Kingdom, Sep. 28, 1976, 40156/76

Int. Cl.[2] A63H *29/16*

U.S. Cl. 46—44 **2 Claims**



1. A doll comprising a head, a torso, two arms and two legs, at least one of said arms being rotatably connected to said torso to provide a rotatable shoulder joint and having a pivoted elbow joint intermediate the end of said arm whereby a distal portion of said arm may be pivoted relative to a proximal portion of said arm, pneumatic operating means for effecting said pivotal motion including a manually operable, variable volume actuator in pneumatic connection with a pressure responsive member disposed in said proximal limb portion, said actuator being comprised of a deformable pressure bulb formed by one of the other limbs or the torso, said pressure responsive member being comprised of a bellows member having one end secured in said proximal limb portion with the other end thereof being movable along the length of said proximal limb portion and connecting means for connecting said pressure responsive member to said distal limb portion so as to cause pivotal movement thereof upon manual operation of the actuator comprising a connecting rod connected at one end to said other end of said bellows member and at the other end to a rotary member attached to said distal limb portion and rotatable about said pivoted elbow joint.

4,156,986

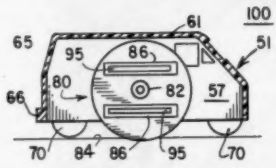
ONE-PIECE MOLDED PLASTIC VEHICLE AND TRANSPORT MEMBER

Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.

Filed Jun. 30, 1977, Ser. No. 811,785

Int. Cl.[2] A63H *29/20*

U.S. Cl. 46—201 **12 Claims**



1. A toy vehicle comprising a body having opposing side walls, a circular transport member having an axle extending outwardly therefrom with journals at the distal ends thereof, means for supporting said axle journals with respect to said side walls to permit free rotation of said circular transport member with respect to said body, means for maintaining a ballast associated with said member evenly distributed around the axis of rotation of said member, the rim of said circular transport member extending beyond the lower boundary of said body to provide a rolling surface for said vehicle.

4,156,987

TOY VEHICLE

Robert G. Lahr, Reseda, Calif., assignor to Ideal Toy Corporation, Hollis, N.Y.

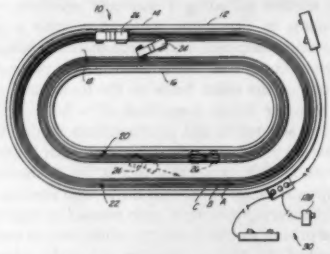
Filed Dec. 5, 1977, Ser. No. 857,056

Int. Cl.[2] A63H *30/02*

U.S. Cl. 46—253 **19 Claims**

1. A toy vehicle comprising a vehicle frame, at least one drive wheel and at least one steering wheel mounted on said frame, said steering wheel being mounted for pivotal steering movement thereon between right and left hand steering positions; a reversible rotary drive motor mounted in said frame and having a rotary output whose opposite directions of rotation in response to the drive of said motor correspond respectively to said steering positions; transmission means in said frame drivingly engaged with said motor for driving said drive wheel in a forward direction regardless of the direction of rotation of said rotary output element; and steering means operatively engaged with said rotary output of the motor and responsive to changes in the direction of rotation of said output for immediately rotating said steering wheel from any instanta-

neous steering position thereof in a continuous uninterrupted swinging motion towards the steering position corresponding



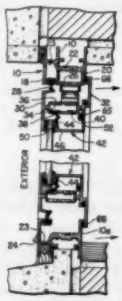
to the direction of rotation of said rotary output upon a reversal of direction of rotation of the motor.

4,156,988

AIR-WATER SEALING SYSTEM FOR METAL WINDOWS AND OTHER IMPROVEMENTS

R. Kumar Grover, Mountlake Terrace, and Waldo C. Erickson, Bothell, both of Wash., assignors to Fentron Industries, Inc., Seattle, Wash.

Filed Nov. 3, 1977, Ser. No. 848,244
Int. Cl.[2] E05D *15/00*; E06B *3/34*
U.S. Cl. 49—390 **12 Claims**



1. An air-water sealing system for metal windows of the type having fabricated inner and outer frames each having jambs, head and sill and one or more glass panes for precluding entry of exterior air to the interior of a building comprising:

an outer peripheral frame encircling the glass pane and joined to a window opening,

an inner peripheral frame encircling a glass pane and having an exterior leg extending outwardly toward said outer peripheral frame, an interior leg extending outwardly toward said outer peripheral frame and spaced from said exterior leg, and an elongated body integral with said legs,

a pressure equalized air space between the inner and outer peripheral frames open to said exterior air,

means joining the inner and outer frames for movement relative to one another,

first interior resilient air sealing means for sealing between the interior leg of said inner peripheral frame and said outer peripheral frame to seal said pressure equalized air space from the interior of the building,

a glazing bead having one end releasably secured to said elongated body and a second end joined to said interior leg of said inner peripheral frame,

second interior resilient air sealing means for sealing between the glazing bead and said interior leg of said inner peripheral frame to seal said pressure equalized air space from the interior of the building, and

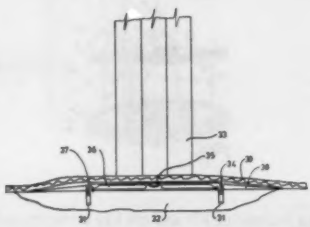
air pressure equalization openings in said outer peripheral frame for allowing exterior air to penetrate into said pressure equalized space between said frames but with such air being blocked by said first and second interior sealing means from the interior of the building.

4,156,989

DOOR STRUCTURE AND MECHANISM FOR SEALING THE GAP BETWEEN THE CLOSURE MEMBER AND FRAMEWORK

Leslie F. Sparrow, 16, Mersey St., Christchurch, 1, New Zealand

Filed Feb. 3, 1977, Ser. No. 765,428
Claims priority, application New Zealand, Feb. 10, 1976, 179967; Jul. 22, 1976, 181537; Aug. 9, 1976, 181716; Oct. 20, 1976, 182383
Int. Cl.[2] E06B *7/16, 7/20*
U.S. Cl. 49—481 **3 Claims**



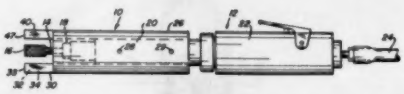
1. A door which comprises a supporting framework defining three sides of an aperture, a closure member supported by the supporting framework and movable above a floor between an open position and a closed position, an inverted channel member defining a fourth side of the said aperture, said inverted channel member having depending sides arranged to lie in slots provided in the floor, and lifting means including a pneumatically inflatable tube lying within said inverted channel member and lying on the floor for moving said inverted channel member from a lowered position to a raised position whereby any gap between said inverted channel member and said closure member when in said closed position, is closed.

4,156,990

GAUGING ATTACHMENT FOR A ROTARY CUTTING TOOL

Edward Rutkowski, Chicago, Ill., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 15, 1978, Ser. No. 878,143
Int. Cl.[2] B24B *23/00*
U.S. Cl. 51—170 PT **2 Claims**



1. An attachment for a tool having a housing and a rotary cutting element installed therein, said attachment providing means to indicate when sufficient stock is removed from a slot wall to obtain the desired slot width, and comprising:

a gauging element extending in a longitudinal direction generally parallel to and spaced apart from the rotary cutting element, said gauging element having a first elongated surface parallel to and spaced exteriorly from a first plane tangent to the periphery of the rotary cutting element and a second elongated surface parallel to the first elongated surface and spaced therefrom a distance slightly less than the desired slot width, said second elongated surface being parallel to and spaced a slight distance inte-

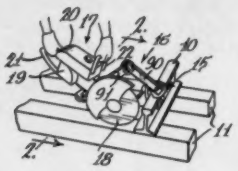
riorly from a second plane tangent to the periphery of the rotary cutting element so that a cutting surface thereof extends beyond the plane of the second elongated surface, and said first and second planes tangent to the periphery of the rotary cutting element being parallel to each other, and a means for securing said gauging element to the tool housing such that said gauging element trails behind the rotary cutting element from an open end of a slot along the wall thereof indicating when the desired width is obtained.

4,156,991

RAIL CUTTING APPARATUS

William P. McIlrath, Racine, Wis., assignor to Racine Railroad Products, Inc., Racine, Wis.

Filed Jan. 9, 1978, Ser. No. 867,832
Int. Cl.[2] B23B *23/02*
U.S. Cl. 51—178 **2 Claims**



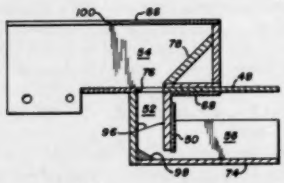
1. A rail cutting apparatus comprising a rail clamp, a linkage structure including a pair of pivotally interconnected links with one link pivoted to the clamp, an offset arm connected to the other of said links, a cutting device having a mounting bar with a mounting element lying in a plane containing the cutting element of the cutting device, means on the offset arm to rotatably engage the mounting element and guide the mounting bar for rotation about an axis lying in said plane and coacting means on said offset arm and mounting bar to positively limit the relative positions of said cutting device relative to said clamp including a stop pin on said offset arm and a pair of adjustable stop members carried by said mounting bar with one at either side of the mounting element to engage said stop pin in either of two rotative positions of the mounting bar.

4,156,992

FEED CONTROL ADAPTER

Joseph L. Pichette, 24 Spruce St., Bloomfield, Conn. 06002

Filed Nov. 7, 1977, Ser. No. 849,030
Int. Cl.[2] B24B *11/02*
U.S. Cl. 51—215 R **10 Claims**



1. A feed control adapter, positionable in the path of movement of articles being fed to an article machining device and operable for effecting the regulation of the feed of the articles while the article machining device is running, comprising:

chamber means providing an entrance to and an exit from the feed control adapter for articles being fed to the article machining device, said chamber means defining a feed path for articles moving through the feed control adapter;

first article flow regulating means mounted in juxtaposed relation to said chamber means for sliding movement relation thereto, said first article flow regulating means being selectively movable between a multiplicity of different portions for providing a first degree of regulation of the flow of articles through the feed control adapter;

second article flow regulating means mounted in juxtaposed relation to said chamber means for sliding movement relative thereto, said second article flow regulating means being selectively movable between a multiplicity of different positions for providing a second degree of regulation of flow of articles through the feed control adapter; and

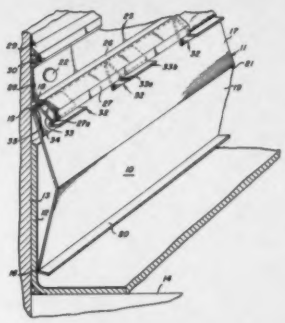
automatic article flow shut-off means mounted in juxtaposed relation to said chamber means, said automatic article flow shut-off means being operative to effect the shut-off of the flow of articles to the article machining device when an excess number of articles are delivered to the article machining device.

4,156,993

REGLET AND COUNTERFLASHING

Paul J. Sorrells, Jr., Tucker, Ga., assignor to MM Systems Corporation, Tucker, Ga.

Filed Apr. 4, 1978, Ser. No. 893,419
Int. Cl.[2] E04D *1/36, 3/38, 13/14*
U.S. Cl. 52—60 **11 Claims**



1. In structure for covering a joint produced from roofing lapped upwardly outside a building wall, the combination which includes first flashing means having lower longitudinal lateral wall means for said lower lateral longitudinal wall means to extend longitudinally laterally outside said roofing lap, and said first flashing means having upper longitudinal lateral wall means for said upper longitudinal lateral wall means to extend longitudinally laterally outside said building wall, said upper longitudinal lateral wall means of said first flashing means having longitudinal laterally projecting means to be engaged; second flashing means for being connected with said building wall and comprising reglet means having hood wall means to extend longitudinally and laterally above said roofing lap and said first flashing means, said hood wall means including apron means for laterally downwardly projecting outside said longitudinal laterally projecting means of said upper lateral longitudinal wall means of said first flashing means and outside said building wall, and said apron means having means to be engaged; and resilient connector and biasing means including at least one unitary member comprising spaced first and second presser means and bight means interconnecting said first and second presser means, said first presser means having means for engaging said engagable means of said apron means, and either said engagable means of said apron means and said engagable means of said first presser means including tongue means and the other of said engagable means of said apron means and said first presser means including groove-forming means, for said connector and biasing means inserted into space inside said hood wall means with said bight means leading and having said tongue means and said

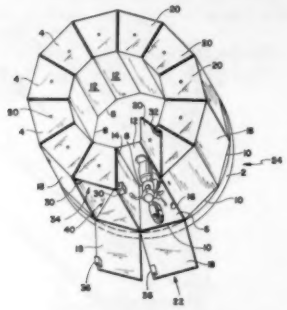
groove-forming means of said first presser means and said apron means engaged to have said second presser means pressing said upper longitudinal lateral wall means of said first flashing means to be supported against said building wall while said lower longitudinal lateral wall means of said first flashing means presses said roofing lap to be supported against said building wall and said bight means restrains said longitudinal laterally projecting means of said first flashing means against downward movement from said space inside said hood wall means by having said apron means arrest rectilinear lateral movement of said first flashing means, at least in a normally downward direction, with said tongue means and said groove-forming means of said first presser means and said apron means being engaged.

4,156,994

GARAGE ASSEMBLY FOR TWO-WHEELED VEHICLES

Charles F. Steuer, and Patricia A. Steuer, both of Walnutport, Pa., assignors to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Sep. 28, 1977, Ser. No. 837,581
Int. Cl.[2] E04B *1/346*
U.S. Cl. 52—65 **7 Claims**



1. A garage assembly for two-wheeled vehicles, said assembly comprising a rotatable circular frame, a plurality of housings connected to said frame, each said housing including a floor portion having a back edge and a front edge, the length of said back edge being less than the length of said front edge, a back wall upstanding from said back edge, side walls upstanding from side edges of said floor portion, a front wall hingedly connected to said front edge, a top portion shaped complementarily to said floor portion and hingedly connected to an upper edge of a first of said side walls, said front wall and said top portion being movable between positions in which said housing is open and in which said housing is closed, first lock means disposed in said housing proximate a forward edge and an upper edge of a second of said side walls, said top portion having second lock means mounted on an interior surface thereof and engageable with said first lock means when said top portion is in said closed position, and third lock means disposed on an interior surface of said front wall and engageable with said first lock means when said front wall is in said closed position.

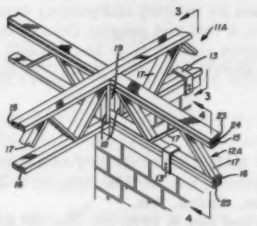
4,156,995

CANTILEVERED CROSS TRUSS CONSTRUCTION

Bertram Zusman, 570 Madera Ave., Youngstown, Ohio 44504

Filed Jun. 16, 1978, Ser. No. 916,294
Int. Cl.[2] E04B *1/34*
U.S. Cl. 52—73 **6 Claims**

1. A load supporting cantilevered cross truss construction comprising several pairs of crossed horizontally disposed truss members, each member including vertically spaced top and bottom chord members and interconnecting web members, one of each pair of truss members being of a greater height than the other so that one truss member of each pair passes through an opening in the other, reinforcing members longitudinally of said other truss member so as to increase the height thereof to that of said higher truss members and means for securing said cross truss members to a foundation inwardly of the ends of said crossed truss members.

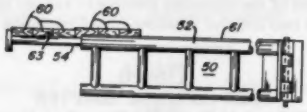


4,156,996

SCAFFOLDING FOR WORKING ON CONTOURED SURFACES

Robert W. Lienhard, Pittsburgh, Pa., assignor to Swiss Fabricating, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 659,991, Feb. 23, 1978, Pat. No. 4,057,943. This application Nov. 11, 1977, Ser. No. 850,715
The portion of the term of this patent subsequent to Nov. 15, 1994, has been disclaimed.
Int. Cl.[2] E04G *3/02*; E04B *11/04*
U.S. Cl. 52—126 **13 Claims**



1. A modular scaffolding apparatus for working on a contoured exterior surface comprising:

a plurality of modular structural members each having integral connectors for engaging other structural members;

said plurality of modular structural members being interconnected to define a pluraltiy of horizontal levels which are spaced apart from the contoured exterior surface;

support means for supporting the structural members at each horizontal level comprising only vertically oriented support columns;

adjustable outrigger members disposed on said plurality of modular structural members and extending horizontally therefrom between the contoured exterior surface and an associated horizontal level;

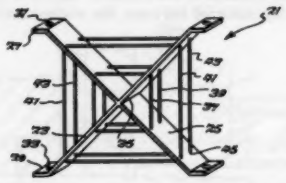
each adjustable outrigger comprises an elongated horizontal fixed portion and an elongated horizontal movable portion which can be moved into close proximity to the contoured external surface; and,

a wooden working surface comprising planks supported on one of said plurality of horizontal levels and the associated outriggers to provide an open horizontal level in close proximity to the contoured external surface which is only interrupted by said vertical support columns.

4,156,997
LIGHT WEIGHT TENSION-COMPRESSION EQUILIBRIUM STRUCTURES

Bert J. Decker, deceased, late of Buffalo, N.Y., and Jean S. Decker, executrix, 136 Capen Blvd., Buffalo, N.Y. 14226

Filed Jul. 14, 1975, Ser. No. 595,853
Int. Cl.[2] E04C 3/10
U.S. Cl. 52—223 R 9 Claims

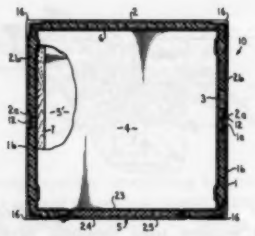


1. A light weight essentially planar structural unit which comprises at least three compression members in contact with each other in an interior portion of the unit and a plurality of tension members in contact with such compression members and exerting balanced forces on the compression members in the plane of the structural unit to hold the compression members in position with respect to each other and to strengthen them, said tension members producing compression forces in the compression members which are directed in the plane of the structural unit toward the point of contact of the compression members in the interior portion of the plane of the structural unit, said forces plus compressive forces applied to the compression members exceeding the amount of force normally required to buckle said compression members and said tension members being distributed along the lengths of the compression members so that the distances between the tension members along the compression members are less than the lengths at which the compression members alone would buckle under the total compressive forces thereon.

4,156,998
EQUIPMENT SHELTER

James B. McClure, 7810 NW. Scenic Dr., Kansas City, Mo. 64152

Filed Dec. 13, 1976, Ser. No. 749,923
Int. Cl.[2] E04C 2/10
U.S. Cl. 52—309.5 12 Claims



1. An equipment shelter having:

a. an outer shell with surrounding side walls and a roof and an inner shell with surrounding side walls and a roof corresponding to said outer shell surrounding side walls and roof,

b. said outer shell having a mold finished outer surface and a laid-up inner surface and comprising at least two polymeric sections each having an integral roof portion, said polymeric sections being joined along a common line extending upwardly along at least one of said outer shell side walls and along said outer shell roof;

c. said inner shell being located within said outer shell and having a laid-up outer surface spaced inwardly in relation to said outer shell and

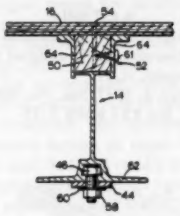
d. a polymeric foam layer extending between said respective outer shell and said inner shell surrounding side walls and roofs,

e. said foam layer extending unbroken across said common line thereby securing said outer shell sections together while integrating said outer shell and said inner shell.

4,156,999
BEAM FOR CONCRETE FORMING STRUCTURES

Peter J. Avery, Toronto, Canada, assignor to Aluma Building Systems, Inc., Ontario, Canada

Continuation of Ser. No. 422,874, Dec. 3, 1973, abandoned, which is a division of Ser. No. 204,132, Dec. 2, 1971, Pat. No. 3,787,020. This application May 2, 1978, Ser. No. 902,103
The portion of the term of this patent subsequent to Jan. 22, 1991, has been disclaimed.
Int. Cl.[2] E04H 12/34; E04B 5/00
U.S. Cl. 52—376 2 Claims



1. An extruded unitary aluminum beam of uniform cross-section, having a base portion, an inverted top hat portion, and a centrally located web portion between said base and top hat portions;

said inverted top hat portion presenting an open channel portion along the entire length of said beam and having a bottom wall connected centrally to said web portion and extending generally perpendicular thereto, side walls extending upwardly from said bottom wall; and a load-supporting portion of said beam consisting of a pair of flanges extending laterally outwardly, one from the top of each of said side wall;

said base portion having a first wall connected centrally to said web portion and extending generally perpendicular thereto, a pair of side walls extending generally downwardly from said first wall, a first pair of flanges extending laterally inwardly, one from the bottom of each of said pair of downwardly extending side walls, so that said first wall and said downwardly extending side walls and said inwardly extending flanges define a centrally disposed generally T-shaped downwardly open slot, said slot being suitable for receiving and retaining a bolt head while permitting the shank of the bolt to project downwardly from the open slot; and a pair of base flanges extending laterally outwardly, one from the bottom of each said pair of downwardly extending side walls and defining a load-transmitting side of said beam;

said web portion of said beam being formed between said base and top hat portions so as to be able to transfer load forces from the load-supporting portion of said beam to said load-transmitting side of said beam, at any point along the length of said beam;

wherein the width and height of said channel presented by said inverted top hat portion are each substantially greater than the width and height, respectively, of said T-shaped slot;

the thickness of said top hat flanges in the direction towards said base portion being greater than the thickness of the side walls of said open channel portion of said inverted top hat portion;

the overall distance between the outer extremities of said base flanges being greater than the overall distance between the outer extremities of said top hat flanges; and wooden beam-stiffening joist means suitable for receiving driveable fastening means and having a substantially rectangular cross-section with a cross-wise dimension substantially equal to the average spacing between said side walls of said open channel portion of said inverted top hat portion, said beam-stiffening joist means being force fitted into said open channel portion of said top hat portion and being mounted in and extending throughout the length of said open channel and being secured in said open channel by driveable means passing through said projecting inwardly from at least one of said side walls of said open channel portion, so as to thereby preclude the inadvertent removal of said beam-stiffening joist means from said open channel portion;

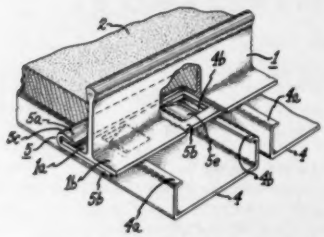
the height of said wooden beam-stiffening joist means having as a maximum limitation the height of said side walls of said open channel portion of said top hat portion.

4,157,000

MOUNTING DEVICE FOR CEILING MEMBERS

Ormond S. Sutter, Placentia, Calif., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 8, 1977, Ser. No. 859,062
Int. Cl.[2] E04B 5/55
U.S. Cl. 52—489 **7 Claims**



1. Mounting device for attaching elongated ceiling panels having opposite flanges directed toward each other to an installed ceiling grid system having elongated grid support members of inverted T-shape having a vertical web with oppositely directed horizontal bottom flanges, said device comprising an elongated clip member formed of a strip having a length greater than its width and being bent along one side so as to form an upper arm portion and a lower arm portion joined by a bight portion and adapted to engage one of the bottom flanges of a grid support member with the flange between said arm portions, said lower arm portion having a plurality of pairs of longitudinally spaced, depending tabs punched out therefrom along its length for attaching a plurality of elongated ceiling panels along the length of said clip member, the tabs in each pair extending in opposite directions away from each other for engaging the flanges of an elongated ceiling panel for holding the same below and extending transverse the grip support member.

4,157,001

FURNACE LININGS

Allan E. Pickles, Merseyside, England, assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Jan. 13, 1978, Ser. No. 869,187
Claims priority, application United Kingdom, Jan. 15, 1977, 1642/77
Int. Cl.[2] F23M 5/00; E04B 1/62
U.S. Cl. 52—506 **11 Claims**

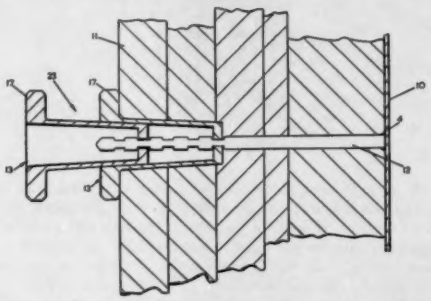
1. A high temperature insulation construction comprising

(1) a structural supporting member,

(2) a body of insulating material superimposed over the structural supporting member,

(3) a metallic stud bearing a plurality of pairs of anchor-engaging notches, the stud being attached at one end of the stud to the structural supporting member and disposed essentially perpendicular to the structural supporting member;

(4) a first anchor positioned over the stud and engaging a first pair of notches in the metallic stud, to hold the body of insulating material between the anchor and the structural supporting member, the first anchor having a tapered cavity which is shaped and dimensioned as to permit an identical anchor to be partially inserted within the cavity in the first anchor and engage a second pair of notches in the metallic stud, the second pair of notches being more distant from the structural supporting member than the first; and



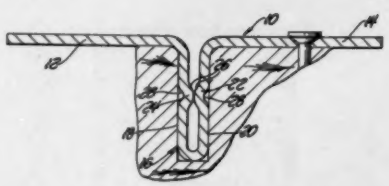
(5) a removable second anchor, essentially identical to the first anchor, fitted within the cavity of the first anchor, engaging the second pair of notches in the metallic stud.

4,157,002

CROSS BRACING FOR WOOD TRUSS BUILDING WALL CONSTRUCTION AND THE LIKE

Floyd L. Adolph, 3315 Harris, Ferndale, Mich. 48220

Filed Dec. 27, 1977, Ser. No. 864,197
Int. Cl.[2] E04H 2/38
U.S. Cl. 52—657 **6 Claims**



1. In a wood frame truss structure including a series of parallel spaced wooden truss members having relatively aligned grooves provided transversely thereacross and a metal cross bracing member received in part within said grooves and fastened to one or more of said truss members, the improvement comprising;

a metal cross bracing member formed to include a depending flange bent back on itself for added structural strength and to provide a width and depth for tight fitted engagement in the aligned grooves in said truss members,

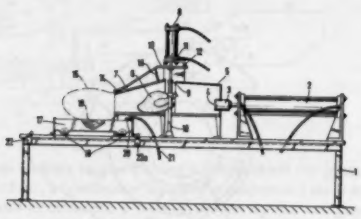
and said depending flange also including a rolled bead provided on at least one side thereof and extending the full length thereof for further enhancing the structural rigidity of said bracing member and the tight fitting self locking engagement thereof in said truss member grooves.

4,157,003

MACHINE FOR A CONTINUOUS COMMERCIALLY PACKING OF SLAUGHTERED FOWL

Josef Kamphaus, Lohne, Fed. Rep. of Germany, assignor to Firma Geflügelschlachterei Gebr. Stolle, Visbek über Vechta, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,334
Int. Cl.[2] B65B *43/36, 39/02*
U.S. Cl. 53—572 9 Claims



1. An improved machine for continuous commercial packing of slaughtered fowl into bags of the type having a packing funnel, a piston which pushes the fowl through the packing funnel and a bag supply which is provided at the discharge opening of the packing funnel, the improvement comprising:

a centering tool disposed in front of the entrance opening of the packing funnel, said centering tool including means for enclosing the legs of the slaughtered fowl and pushing the legs into the path of said piston, said means being movable in timed relationship with respect to said piston;

drive means for reciprocally moving said means for enclosing and pushing between an operating and non-operating position; and

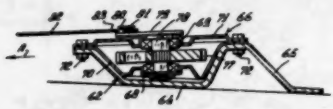
a bag clamping element coupled to and actuated by said drive means for clamping a bag from said bag supply onto the rim of said discharge opening of said packing funnel.

4,157,004

MOWING MACHINES

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Sep. 13, 1976, Ser. No. 722,508
Claims priority, application Netherlands, Sep. 11, 1975, 7510687
Int. Cl.[2] A01D *55/22*
U.S. Cl. 56—13.6 41 Claims



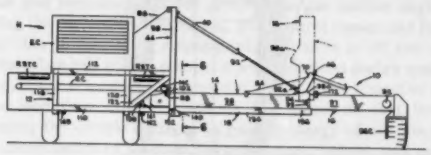
1. A mowing machine comprising a frame with coupling means and elongated supporting means extending laterally of said coupling means, a plurality of cutting rotors mounted along the length of said supporting means and driving means connected to rotate said rotors about corresponding upwardly extending axes, said supporting means including an elongated ground engaging plate that mounts said rotors and is a base plate therefor and further mounts said driving means, said mounting plate being configured to slide over the ground and having a forward portion and a lower channel section, said forward portion extending upwardly from said lower channel section, with respect to the normal direction of travel, said driving means including at least one respective gear and a gear box containing said gear, said gear box being housed, at least in part, in said channel section and being readily removable and replaceable as a unit relative to said plate.

4,157,005

DIRECT-LOADING CROP HARVESTING APPARATUS

Franklin P. Orlando, Morgan Hill, and Ronald W. Droll, Modesto, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Mar. 7, 1977, Ser. No. 775,002
Int. Cl.[2] A01D *61/02, 75/22*
U.S. Cl. 56—228 10 Claims



1. An improved harvester including a main frame movable along a path, means mounted on the frame for picking up crops along said path, first conveyor means for moving harvested crops longitudinally in a direction generally parallel to said path, second conveyor means for receiving crops from said first conveyor means and for moving said crops transversely toward one side of said harvester, and discharge elevator means for receiving crops transferred from said second conveyor means and for moving said crops upwardly and outwardly with respect to said one side of said harvester, wherein the improvement comprises: said elevator means comprising an articulated structure having an upper leg and a lower leg which has an outer end that is pivotally interconnected to the inner end of said upper leg and further having means for pivoting said upper leg relative to said lower leg, a storage framework transversely mounted to said main frame, said framework defining a storage channel situated directly below said second conveyor means, cradle means slidable within said channel for supporting said elevator means in a generally horizontal position when the elevator means is to be stored and also when it is to be pivotally interconnected to said framework, said cradle means being arranged to support, during the storage of said elevator means, said lower leg of the elevator means within the confines of said channel while said upper leg is pivoted into a vertical position directly adjacent said one side of the body of the harvester, said cradle means continuing to support said elevator means as it is pulled from said channel to a laterally extended position whereat the inner end of said lower leg is adjacent the discharge end of said second conveyor means to thereby facilitate the detachable pivotal attachment of said lower leg to said framework means; said framework and said elevator means having means for permitting their detachable, pivotal interconnection.

4,157,006

DEVICE FOR TWISTING YARNS WHICH ARE WOUND UNDER CAKE PACKAGE FORM

Felix Guillot, Roanne, France, assignor to ASA S.A., Roanne, France

Filed Feb. 28, 1978, Ser. No. 881,990
Int. Cl.[2] D01H *7/00*
U.S. Cl. 57—59 5 Claims

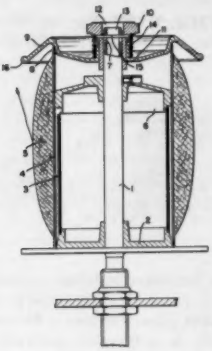
1. In a device for direct up-twisting of a package having the form of a cake, said device being of the type including:

(a) a vertical spindle adapted for being rotatably driven at constant or variable speed; and

(b) cake centering and positioning means on said spindle including first and second opposed cones for engaging the ends of a take-up tube which supports the wound yarn;

an IMPROVEMENT in said cake centering and positioning means wherein said first cone is fixedly secured to the spindle, said cake centering and positioning means further including a circular centering element between said cones, means for securing said centering element to said first cone for rotation with the spindle, said centering element

having a diameter only slightly smaller than the take-up tube for engaging and rotatably driving the tube, means for urging the cones toward each other to position the



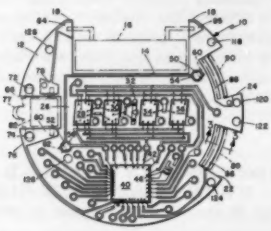
cake therebetween, and a cap flyer associated with the second cone and having a diameter larger than the outer diameter of the package to control yarn ballooning during the unwinding operation.

4,157,007

ASYMMETRIC DIGITAL WATCH MODULE

John Vennard, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 22, 1976, Ser. No. 753,364
Int. Cl.[2] G04C *3/00, 19/00*
U.S. Cl. 58—23 R **22 Claims**



1. An electronic watch module having a thin profile, said module comprising:

a printed circuit board having a generally flat circular configuration defining a face and a back,

electronic watch components including display means mounted on said face of said board, and

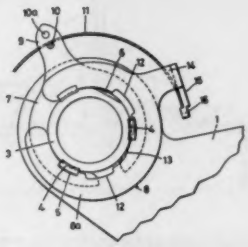
a cover permanently secured to said face and defining walls spaced from and hermetically sealing said electric watch components on the face of said board, said cover having separate hermetically sealed compartments including a transparent portion covering said display means and an opaque portion covering other components on said face, the thickness of said module being defined substantially by the sum of the thickness of said board and the thickness of said cover.

4,157,008

MECHANICAL WATCH MOVEMENT

Friedrich Perrot, Lengnau, Switzerland, assignor to ETA A.G. Ebauches-Fabrik, Grenchen, Switzerland

Filed Dec. 7, 1976, Ser. No. 748,182
Claims priority, application Switzerland, Dec. 12, 1975, 16170/75
Int. Cl.[2] G04B *17/00*
U.S. Cl. 58—107 **4 Claims**



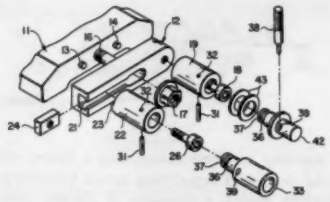
1. In a mechanical watch movement of the type wherein a balance-cock supports a balance arranged to pivot in bearings about a fixed axis, and a balance-spring is fixed at its inner end to said balance and at its outer end to a bent arm of a thin, blanked plate constituting a support member detachable from the remainder of said movement, the improvement wherein said bent arm is blanked with a flat guiding element and with a positioning element, said guiding element being parallel to said balance axis and tangentially disposed with respect to the outer end of said balance spring, said positioning element being at an angle to and radially displaced from said guiding element, said guiding and positioning elements embracing said outer end of said balance spring along an outer side face and a front end face thereof, and a weld between said guiding element and said spring outer end.

4,157,009

TOOL BAR ASSEMBLY FOR TRACK PRESSES

Harvey W. Janssen, Lafayette, Calif., assignor to Wolff Manufacturing Company, Burlingame, Calif.

Filed Mar. 27, 1978, Ser. No. 890,146
Int. Cl.[2] B21L *19/00*
U.S. Cl. 59—11 **3 Claims**



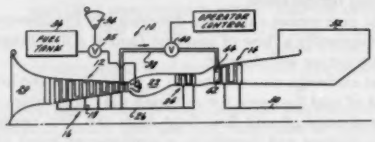
1. An adjustable pitch tool bar assembly for track presses including a tool bar adapted to be mounted to a track press tool head, spaced pin and bushing tool holders secured at spaced positions on said tool bar, pin and bushing tools adapted to be mounted on said holders, and means for removably securing said pin and bushing tools to said pin and bushing tool holders respectively, said means including a stud on said pin and bushing tools, an eccentric groove formed in said stud adjacent the end thereof, a well in each of said holders for receiving the stud of the associated tool, and a cross pin in said holder extending into said well to be engaged by the surface of said groove when the associated tool is rotated after the stud has been seated.

4,157,010

GAS TURBINE ENGINE WITH POWER MODULATION CAPABILITY

Edward D. Sailer, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jun. 3, 1977, Ser. No. 803,090
Int. Cl.[2] F02C 7/00, 7/02
U.S. Cl. 60—39.04 **3 Claims**



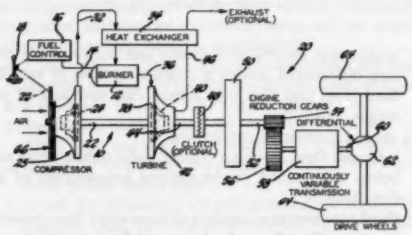
1. In a gas turbine engine having a compressor for pressurizing a flow of air, a combustor in which compressed air is mixed with fuel and combusted, a turbine driven by the hot gases of combustion and drivingly connected to said compressor, and a separate power turbine said engine characterized by a predetermined relationship of power output versus compressor inlet ambient temperature at maximum compressor flow, a device for modulating the engine power output at a low ambient temperature comprising means for bypassing a portion of the air discharged from the compressor around the combustor and for reintroducing the portion into the cycle between the compressor and power turbines, means for modulating the bypass flow rate, and a throttle for modulating fuel flow rate, the resulting power level thereby exceeding the predetermined relationship at the same low ambient temperature.

4,157,011

GAS TURBINE FLYWHEEL HYBRID PROPULSION SYSTEM

Sidney G. Liddle, Harper Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 22, 1977, Ser. No. 826,641
Int. Cl.[2] F02C 9/02
U.S. Cl. 60—39.27 **1 Claim**



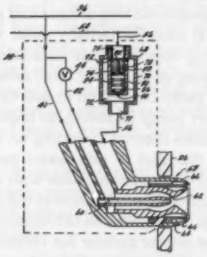
1. A hybrid vehicular propulsion system comprising a gas turbine engine, said engine including a compressor having an air inlet and outlet, an impeller having blades thereon located within said compressor, means including a fuel controller and a turbine for driving said impeller during an on mode wherein fuel is supplied to the gas turbine engine and an off mode of operation wherein fuel supply is terminated to the gas turbine engine, a power shaft connected to said turbine, an auxiliary flywheel directly connected to said power shaft for driving said turbine and said gas turbine engine during an off mode of operation, inlet air control means to minimize compressor impeller blade pump loss during the off mode of operation, said inlet air control means including a plurality of flow control elements in said inlet of said compressor to reduce flow of air through the impeller to two to three percent of normal air flow therethrough during the off mode and sufficient to carry off heat generated by windage loss of said impeller, means coupling said auxiliary flywheel to be driven by the turbine at no speed reduction to minimize the mass of said auxiliary flywheel, and means coupled to said flywheel including a continuously variable transmission for driving the vehicle, said inlet air control means being operative to close said flow control elements during engine start to eliminate pumping losses from the compressor impeller, means for concurrently positioning said inlet air control means and said fuel controller when the engine is up to idle speed to open the flow control vanes and introduce fuel for driving the gas turbine engine during the on mode of operation, said control means and fuel controller further being continuously operative at off and on cycles when said engine reaches a predetermined design speed irrespective of load changes thereon, the off cycle operative to close said flow control elements and terminate fuel flow whereby the vehicle is driven by built-in energy of rotation of the combination of said auxiliary flywheel, turbine and said compressor impeller with the built-in energy of rotation supplying power during a transient fall in engine speed to 80% to 85% of said predetermined engine design speed, the on cycle reopening said inlet air control means and fuel controller thereafter when the engine speed drops to 80% to 85% of said predetermined engine design speed to reopen air flow to said compressor and reintroduce fuel to reinstitute the on mode of gas turbine engine operation until the predetermined engine design speed is reestablished.

4,157,012

GASEOUS FUEL DELIVERY SYSTEM

Thomas L. DuBell, Maineville, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 24, 1977, Ser. No. 780,691
Int. Cl.[2] F02C 7/22
U.S. Cl. 60—39.46 G **17 Claims**



16. A system for delivering gaseous fuel to the combustor of a gas turbine engine, said system comprising:

a gaseous fuel circuit;

means for supplying said circuit with pressurized gaseous fuel;

a plurality of gaseous fuel injectors disposed within said circuit adapted to spray said pressurized gaseous fuel into said combustor;

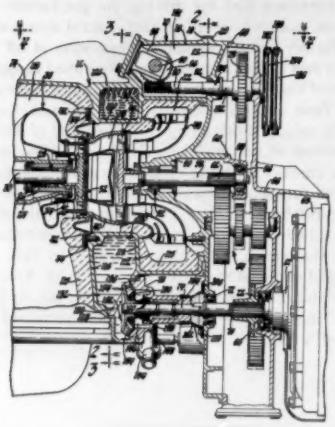
a fuel distribution manifold adapted to receive said pressurized fuel from said supply means and to distribute said pressurized fuel to said plurality of injectors; and

means disposed in said circuit downstream of said distribution manifold for preventing pressure perturbations occurring within said combustor from compressing said gaseous fuel in said manifold during periods of gaseous fuel flow through said fuel injectors.

4,157,013
WATER COOLED AUTOMOTIVE GAS TURBINE ENGINE

Albert H. Bell, III, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 8, 1977, Ser. No. 831,616
Int. Cl.[2] F02C 7/10, 7/12
U.S. Cl. 60—39.51 H 4 Claims



1. A regenerative automotive gas turbine engine comprising a combustor, a pair of rotary regenerator assemblies with inboard seals, a block including an annular regenerator seal surface on opposite sides thereof for supportingly receiving said inboard seals, a gas turbine section in said block having a power shaft, said power shaft connected to a power turbine on one end thereof, means for directing exhaust from said combustor across said turbine and through said regenerator assemblies, said block including spaced walls defining a water passage therein located radially outwardly of the gas turbine in surrounding relationship thereto, a water fill in said passage to define a liquid containment ring around said power turbine seal cross arms integral with the radially outer wall of said water passage and having opposite ends connected to each of said annular seal surfaces, each of said cross arms including a root segment, a water pump connected to said block at a low point thereon, said water pump including an impeller having a plurality of radial blades thereon including an inlet edge in communication with the inlet to said water pump and an outlet edge thereon in direct communication with said water passage for discharging water upon operation of the pump directly into said water passage for circulation therethrough in surrounding relationship to the power turbine for removing heat from the block through said root prior to conduction thereof to the annular seal surfaces thereby to maintain the temperature of the seal surfaces and said cross arm below a thermal distortion level.

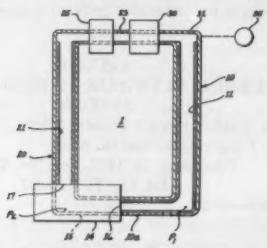
4,157,014
DIFFERENTIAL PRESSURE SYSTEM FOR GENERATING POWER

Robert W. Clark, Jr., 2232 W. Joan de Arc Ave., Phoenix, Ariz. 85029

Continuation-in-part of Ser. No. 555,399, Mar. 5, 1975, abandoned. This application Feb. 13, 1976, Ser. No. 657,877
Int. Cl.[2] F03G 7/06; F01K 23/02
U.S. Cl. 60—655 7 Claims

1. A system having two segregated but co-acting subsystems for generating power by employing induced density variations of the fluid within each of the subsystems, which density variations result in a pressure differential in each fluid to generate a harnessable flow of the respective fluid, said system comprising in combination:

I. a first subsystem comprising:
- a. a first fluid having the characteristic of density reduction in response to a temperature variation above or below a first predetermined temperature and having the further characteristic of conversion to a mixture of said first fluid in a solid and liquid state at a second predetermined temperature;
- b. first pipe means extending downwardly for conveying downwardly a flow of said first fluid at a first range of temperature and density;
- c. heat exchange means disposed in proximity to the lower end of said first pipe for reducing the temperature and the density of said first fluid from the first range of temperature and density to a temperature equal to or less than the second temperature and within a second range of temperature and density, said heat exchange means having an inlet for receiving the flow of said first fluid from said first pipe means and an outlet for discharging the received flow of said first fluid;
- d. second pipe means extending upwardly from said outlet for conveying upwardly said first fluid discharged through said outlet; and
- e. power transfer means for receiving the flow of fluid from said second pipe means and converting the kinetic energy of the conveyed fluid into harnessable power; whereby, the density of said first fluid within said first pipe means is greater than the density of said first fluid



within said second pipe means and the resulting pressure differential insures a continuing flow of said first fluid from said first pipe means into said second pipe means; and

II. a second subsystem comprising:
- a. a second fluid having a boiling point temperature at or below the second predetermined temperature of said first fluid;
- b. third pipe means extending downwardly for conveying downwardly a flow of said second fluid at a third range of temperature and density;
- c. said heat exchange means including:
  - i. a further inlet for receiving the flow of said second fluid from said third pipe means;
  - ii. an orifice for converting said second fluid from a liquid state to a gaseous state and reducing the temperature and the density of said second fluid conveyed through said further inlet from the third range of temperature and density to a fourth range of temperature and density wherein the temperature is equal to or less than the second predetermined temperature of said first fluid; and
  - iii. heat transfer means for transferring heat from said first fluid to said second fluid to reduce the temperature and density of said first fluid to the second range of temperature and pressure and convert said first fluid into a mixture of said first fluid in a solid and liquid state; and

iv. a further outlet for discharging the flow of said second fluid from said heat exchange means;

d. fourth pipe means extending upwardly from said further outlet for conveying upwardly said second fluid discharged through said further outlet; and

e. further power transfer means for receiving the flow of fluid from said fourth pipe means and converting the kinetic energy of the conveyed fluid into harnessable power; whereby, the density of said second fluid within said third pipe means is greater than the density of said second fluid within said fourth pipe means and the resulting pressure differential insures a continuing flow of said second fluid from said third pipe means into said second pipe means;

whereby, each of said first and second subsystems is capable of generating power and said first subsystem is capable of converting said first fluid in liquid form to a mixture of said first fluid in liquid and solid state without an external source of heat.

4,157,015

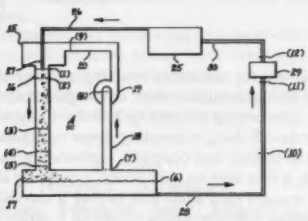
HYDRAULIC REFRIGERATION SYSTEM AND METHOD

Craig Hosterman, Scottsdale, and Warren Rice, Tempe, both of Ariz., assignors to Natural Energy Systems, Tempe, Ariz.

Filed Dec. 19, 1977, Ser. No. 862,119

Int. Cl.[2] F25B *1/00*; F25D *15/00*; F25B *1/06*

U.S. Cl. 62—115 **18 Claims**



1. Apparatus for compressing and withdrawing heat from the refrigerant fluid in a refrigeration system, which refrigeration system includes an expansion valve and an evaporator, said apparatus comprising in combination:

a. a down pipe, including a plenum disposed at the upper end thereof, for conveying the refrigerant fluid downwardly;

b. a fluid non-miscible with the refrigerant fluid;

c. means for introducing the non-miscible fluid into said down pipe and urge downward flow therethrough;

d. means for conveying the refrigerant fluid from the evaporator to said down pipe;

e. means for entraining the refrigerant fluid within the non-miscible fluid flowing downwardly through said down pipe to convey the refrigerant fluid downwardly and compress the refrigerant fluid by the head of the non-miscible fluid;

f. a separation chamber disposed at the lower end of said down pipe for receiving and segregating the refrigerant fluid and the non-miscible fluid;

g. pipe means for withdrawing the refrigerant fluid from said separation chamber and conveying it to the expansion valve;

h. further pipe means for withdrawing the non-miscible fluid from said separation chamber; and

i. heat sink means for dissipating heat from the non-miscible fluid;

whereby, heat is withdrawn from the refrigerant fluid and the non-miscible fluid simultaneous with compression of the refrigerant fluid during downward flow thereof through said down pipe.

17. A method for compressing and withdrawing heat from a refrigerant fluid within a refrigeration system having an evaporator and an expansion valve, said method comprising the steps of:

a. establishing a downward flow of a fluid non-miscible with the refrigerant fluid within a down pipe;

b. conveying the refrigerant fluid from the evaporator to the upper end of the down pipe;

c. entraining the refrigerant fluid within the downward flow of the non-miscible fluid;

d. separating the refrigerant fluid from the non-miscible fluid at the lower end of the down pipe;

e. transmitting the separated refrigerant fluid from the lower end of the down pipe to the expansion valve; and

f. dissipating heat from the refrigerant fluid within the down pipe;

whereby, the compression and heat dissipation phases of the refrigeration cycle are performed within the down pipe.

4,157,016

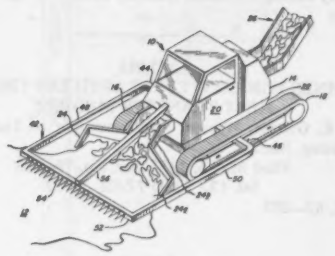
CRYOGENIC BEACH CLEANER

Robert F. Wendt, 2649 Mason St., Madison, Wis. 53705; Jan R. Acker, 4402 Dwight Dr., #B, Madison, Wis. 53701, and Norman R. Braton, 457 Agnes Dr., Madison, Wis. 53711

Division of Ser. No. 576,687, May 12, 1975, Pat. No. 4,043,140. This application Jun. 15, 1977, Ser. No. 806,829

Int. Cl.[2] B01D *9/04*

U.S. Cl. 62—123 **8 Claims**



1. A cryogenic beach cleaning machine for cleaning a sandy beach which has been contaminated by oil from an oil spill mixing with the beach sand, which comprises:

means for moving said machine along said beach;

means for contacting at least a portion of the contaminated area with a liquid cryogen so as to solidify the mixture in the contacted area extending forwardly from said machine; and

means for separating the solidified mixture from the remainder of the beach extending forwardly from said machine, said separation means positioned in trailing relation to said contacting means.

4,157,017

CONTINUOUS PREPARATION OF SOFT, MELT-RESISTANT, FROZEN CONFECTION

Scott F. Reid, 2110 Birchwood Dr., Reynoldsburg, Ohio 43068, assignor to Betty Jane Reid and Betty Jane Reid and Scott F. Reid, all of Reynoldsburg, Ohio, as trustees for Linda Marie, Jeffrey Alan and Michael David Reid

Continuation-in-part of Ser. No. 346,436, Mar. 30, 1973, abandoned. This application Feb. 26, 1976, Ser. No. 661,496

Int. Cl.[2] A23G *9/00*

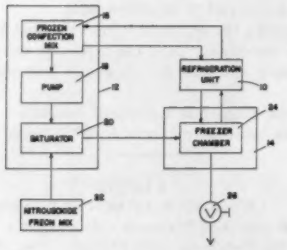
U.S. Cl. 62—135 **6 Claims**

1. A closed flow through apparatus for the continuous preparation of a frozen dairy-type confection, the apparatus comprising:

(a) A mix receptacle for containing a liquid confection mix;

(b) a pump means connected to said mix receptacle for projecting mix from said mix receptacle into a saturator;

(c) a saturator comprising an enclosed receptacle connected to said pump for atomizing and gassifying said mix;
(d) a source of pressurized gas connected in communication with said saturator for continuously applying a pressure head upon the interior of said saturator;
(e) a refrigerated freezing chamber having a dasher, a valved outlet and an inlet connected to said saturator for receiving gassified mix propelled by said pressure head;



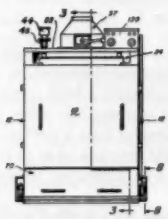
(f) refrigeration apparatus for cooling at least said freezing chamber, and
(g) a pressurized source of an edible refrigerant connected through a metering means to said saturator for periodically adding a selected quantity of said refrigerant to said mix.

4,157,018

MACHINES FOR CONVEYING ARTICLES THROUGH A HEAT TRANSFER MEDIUM

Costas E. Goltsos, Weston, Mass., assignor to Teckton, Inc., Wellesley, Mass.

Filed May 6, 1977, Ser. No. 794,365
Int. Cl.[2] F25D *17/02, 25/02*
U.S. Cl. 62—373 **6 Claims**



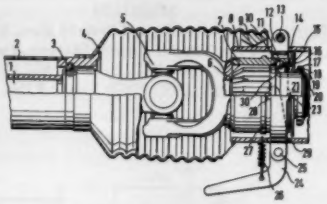
1. An apparatus for quick freezing of articles by exposing them to a cryogenic carbon dioxide comprising:
means defining a column having an inlet at one end and an outlet at the other end, the column being receptive to a plurality of trays disposed in a heightwise stack within the column, said trays being receptive to said articles;
said trays being further constructed to define flow spaces between each adjacent pair of trays;
means for spraying cryogenic carbon dioxide into at least some of the spaces between adjacent trays, said means including an elongate outer tube; a plurality of small diameter tubes extending within the outer tube, each of the small diameter tubes having an outlet end which protrudes through the outer tube, each of the outlet ends being disposed in spaced relation along the outer tube; the inlet ends of each of the smaller tubes being attached to a fitting located at the other end of the outer tube; a control valve connected to the fitting, the control valve having an outlet diameter which is no smaller than the aggregate cross-sectional flow area of the inner tube thereby to preclude expansion of liquid carbon dioxide as said liquid carbon dioxide flows from the outlet of the control valve to the inlets of the inner tube; each of the outlet ends of the small diameter tubes being constructed and arranged to direct a jet of cryogenic carbon dioxide into the flow space and at an angle which will initially impinge on the underside of the more upper of the adjacent trays and thereafter be deflected downwardly;
a source of liquid carbon dioxide in communication with the control valve.

4,157,019

RELEASABLE COUPLING DEVICE FOR A POWER TRANSMISSION SHAFT

Wilhelm von Allworden, Erbach, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,705
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1976, 2643323
Int. Cl.[2] F16C *1/06*
U.S. Cl. 64—4 **6 Claims**



1. A device for releasably coupling a power take-off shaft of a tractor to a transmission shaft of an agricultural implement or the like, comprising a coupling hub drivingly mounted on the power take-off shaft, a coupling drum substantially fixed relative to the tractor and coaxially surrounding and spaced from said hub, a first stop on said drum, a coupling sleeve mounted on said transmission shaft and having a second stop thereon, quick-release fastener means including a spring biased locking ring spaced from said second stop and balls retained by said locking ring for detachably connecting said sleeve in driving engagement with said hub, a release lever pivotally mounted on a fixed pivot on said drum and engageable with said locking ring, an actuating lever pivotally connected to said release lever at a point spaced from said fixed pivot and having an arm engageable with said second stop, pivotal movement of said actuating lever pivots said release lever about its fixed pivot so that the release lever engages the locking ring to release the balls of said fastener means and disengages said sleeve from said hub and further pivoting of said actuating lever about said first stop brings said arm into engagement with said second stop to push the disengaged sleeve from said hub.

4,157,020

METHOD OF AND DEVICES FOR LUBRICATING ROTATING TORQUE TRANSMITTING COUPLINGS

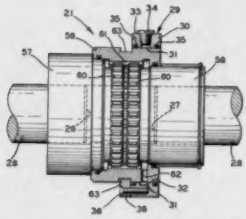
Otto V. Young, Toledo, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Jul. 5, 1977, Ser. No. 812,759
Int. Cl.[2] F16D *3/18*
U.S. Cl. 64—9 R **1 Claim**

1. In a torque transmitting coupling for use in a continuously operating drive train, the combination comprising:
a. a pair of opposed coupling members;
b. an intermediate coupling member drivingly interconnecting said opposed coupling members and having lubricating passages therein;
c. a lubricating ring comprising a unitary one-piece body having a centrally disposed groove in the surface of its inner face and frictionally mounted on said intermediate coupling member for rotation therewith, but which is

capable of being held stationary relative thereto so that rotation of said ring can be periodically interrupted for introducing lubricant into the groove of said ring, said groove being confluent with the lubricating passages in said intermediate coupling member;

d. a pair of spaced-apart O-rings mounted in the inner face of said lubricating ring, one on each side of said lubricating groove therein and contacting said intermediate coupling member for sealingly and frictionally engaging said lubricating ring to said intermediate member;



e. means attached to and projecting from said lubricating ring for movement therewith, said means comprising at least one peg extending from a side of said lubricating ring and being adapted to be grasped by an operator for holding said lubricating ring stationary while said coupling is rotating; and

f. means for retaining said lubricating ring on said intermediate member, said retaining means comprising a portion of said peg which projects into an annular groove provided in the outer surface of said intermediate coupling member for retaining said lubricating ring thereon.

4,157,021

TORQUE ADJUSTER

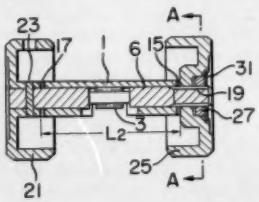
Yukikazu Tsuchiya, Kamakura, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 15, 1977, Ser. No. 851,747

Claims priority, application Japan, Nov. 25, 1976, 51-156998[U]

Int. Cl.[2] F16D *7/02;* G02B *21/26*

U.S. Cl. 64—30 C **7 Claims**



1. A torque adjuster including a rotary shaft having a diameter which is uniform over a predetermined range thereof, control means comprising a manually rotatable first knob fitted to said rotary shaft for rotating the same, a stationary member, and a first friction member provided between said control means and said stationary member, said control means being movable axially of said rotary shaft to vary the force with which said control means urges said friction member, thereby adjusting the torque of said control means; a second friction member for coupling said control means and said rotary shaft with a frction force greater than the friction force created between said control means and said stationary member by said first friction member so that the rotation of said control means is transmitted to said rotary shaft without loss; the coupling force created between said rotary shaft and said control means by said second friction member being of such a magnitude that said control means is movable axially of said rotary shaft by an extraneous force exerted thereon and that upon removal of said extraneous force said control means be fixed at its last position; and coupling means for coupling together said first knob and said second friction member, said second friction member being formed of a synthetic resin material, said rotary shaft having a male screw at one end thereof, and said second friction member threadedly engaging the male screw of said rotary shaft by self-tapping by means of rotation of said knob.

4,157,022

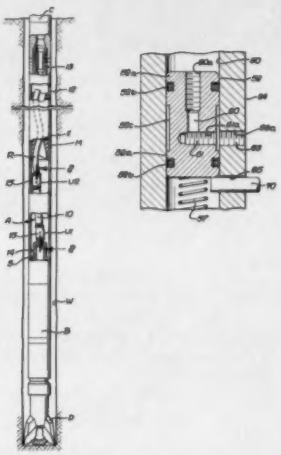
PRESSURE COMPENSATING COUPLING FOR IN HOLE MOTORS

Gary M. Crase, Cypress, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Oct. 3, 1977, Ser. No. 838,649

Int. Cl.[2] F16D *3/84*

U.S. Cl. 64—32 R **18 Claims**



1. A pressure compensating connecting rod assembly comprising: a tubular connecting rod body; universal joints at the ends of said body; boot means enclosing said universal joints for containing a lubricant in said body and said universal joints; and equalizing means in pressure transfer relation with said boot means internally of said boot means and with the exterior of said body for equalizing the pressure acting on said boot means while enabling thermal expansion of the lubricant.

4,157,023

APPARATUS AND METHOD FOR LAYING PIPELINES

Benjamin C. Tisdale, River Ridge, La., and William B. Nicholson, Corpus Christi, Tex., assignors to Martech International, Inc., Houston, Tex.

Filed Oct. 14, 1977, Ser. No. 841,998

Int. Cl.[2] B21D *3/02;* F16L *1/00*

U.S. Cl. 72—161 **13 Claims**

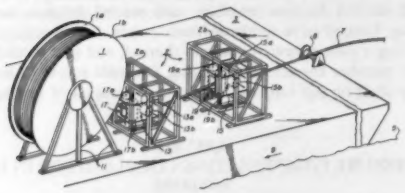
1. In an apparatus for the laying of pipeline on the floor of a body of water and in which the pipeline is first wound onto or unwound from the upper portion of a rotatable reel mounted on a vessel adapted to move on the surface of the body of water as the pipeline is thereafter unreeled therefrom comprising:

a first and second roller means on the vessel having their axes in parallel, each said roller means respectively including an upper roller and a lower roller for selectively contacting the pipeline as the reel rotates,

the lower roller of said second roller means being adapted to apply force against the pipeline as it passes thereover

while the upper roller of said second roller means is free from the application of loads thereon,

the upper roller of said first roller means positioned substantially below a line extending between the rollers of said



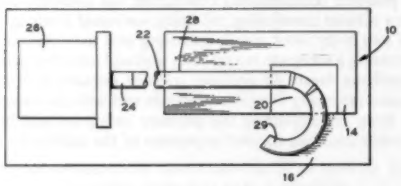
second roller means to the axis of the pipeline at the point where it first contracts the reel or pipeline wraps thereon to thus snub the pipeline into tension against the reel as it is wound thereonto at the top thereof.

4,157,024

FORMING DIE AND PROCESS FOR TUBULAR FITTINGS

Kurt J. Kahlow, North Canton, and Richard L. Holbrook, Louisville, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,735
Int. Cl.[2] B21D *7/08*
U.S. Cl. 72—168 **6 Claims**



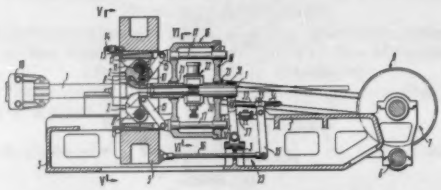
1. A composite die for forming an elbow from a straight tube pushed therethrough comprising a tubular inlet guide section, a swaging section in the form of a truncated cone connected and opening at its large end to one end of the inlet guide section and constructed and arranged so that the tube while pushed therethrough is subjected to circumferential swaging forces varying from a maximum at one location on its circumference to a minimum value at another opposed location on its circumference and to subject it to an offset of die forces producing a force moment, to cause bending of the tube about the location subjected to the minimum swaging forces and thickening of the tube wall, partial forming of the elbow and reduction in tube diameter, and a tubular bending section, forming a passageway of uniform diameter connected and opening at one end to the small end of the cone of the swaging section and constructed and arranged so that the tube while pushed therethrough is subjected to further bending to further form the elbow.

4,157,025

METHOD AND MILL FOR ROLLING METAL BILLETS

Vladimir N. Vydrin, ulitsa Timiryazeva, 28, kv. 27; Evgeny N. Berezin, ulitsa Engelsa, 28, kv. 72; Vladimir G. Dremin, ulitsa Beloretskaya, 70, kv. 22, all of Chelyabinsk; Oleg I. Tischenko, ulitsa Lenina, 6, kv. 3, Temirtau, and Gennady Z. Serebrennikov, ulitsa Rumyantseva, 27, kv. 55, Chelyabinsk, all of U.S.S.R.

Filed Dec. 5, 1977, Ser. No. 857,509
Int. Cl.[2] B21B *21/00*
U.S. Cl. 72—189 **6 Claims**



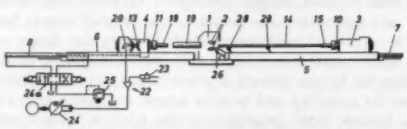
1. A mill for rolling metal billets in a single pass comprising: a frame having guides running in parallel with the axis of the billet being worked; a drive mounted on said frame; a roll housing mounted in the guides of said frame and geared to said drive to reciprocate the roll housing inside said guides of said frame; at least four variable-radius workrolls mounted in said roll housing symmetrically with respect to the axis of the billet in such a manner that the geometrical axes of rotation of said workrolls are disposed in one plane perpendicular to the axis of the billet, and said workrolls being rotated about said axes during rolling positively and in synchronism with the reciprocations of the roll housing, each workroll having a section shaped as a sector of a circle in a plane perpendicular to the geometrical axis of its rotation, the axis of the sector being disposed eccentrically relative to said geometrical axis of the workroll rotation so as to define a curvilinear section on the surface thereof having a variable radius of curvature, each workroll having a sizing section on the side of the billet emerging from the workrolls, mating with the curvilinear section, the sizing section being formed in such a manner that all generatrices of its surface run in parallel with the axis of the billet at the end of the working movement of the workroll, the length of the sizing section axially along the billet being determined from the formula $l \geqq S \cdot \lambda$, wherein S is the axial feed of te billet through one step and λ is the elongation of the latter; a feeder for axially feeding the billet, mounted on said frame on the side of the billet entry into said workrolls and geared to said drive.

4,157,026

SWAGING MACHINE FOR SWAGING LARGE TUBES

Bruno Kralowetz; Hans Hojas, and Johann Braunwieser, all of Steyr, Austria, assignors to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

Filed Mar. 20, 1978, Ser. No. 888,411
Claims priority, application Austria, Apr. 1, 1977, 2272/77
Int. Cl.[2] B21J *7/18;* B21D *43/00*
U.S. Cl. 72—401 **11 Claims**



1. A swaging machine for swaging large tubes, comprising a swaging box,

a first and second gripping heads consisting of a manipulator

and a holder-up, respectively and disposed on opposite sides of said swaging box,

first and second gripping sleeves which are rotatably mounted in said first and second gripping heads, respectively, and aligned on a horizontal axis which extends through said swagging box, said first and second sleeves being axially coupled to said first and second gripping heads, respectively, each of said gripping heads being movable along said horizontal axis,

swaging die means contained in said swaging box and operable to strike radially toward said horizontal axis,

rotary drive means for rotating said first and second sleeves about said horizontal axis,

a mandrel, which is non-rotatably and axially immovably mounted in said first sleeve and adapted to carry a tubular workpiece surrounding said mandrel,

first and second abutments carried by said first and second gripping sleeves, respectively, and having first and second annular gripping surfaces, respectively, which surround said horizontal axis and generally face each other, said abutments being adapted to axially engage and exert a gripping force on a tubular workpiece surrounding said mandrel only with said first and second annular gripping surfaces,

axial drive means for moving said first gripping head along said horizontal axis toward said swaging box and for simultaneously moving said second gripping head in the same direction, and

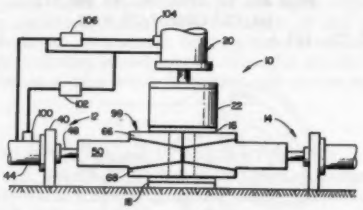
control means for sensing the magnitude of said gripping force exerted by said abutments with said first and second annular gripping surfaces and for detecting any deviation of said magnitude from a set value and for controlling the movement of said second gripping head relative to said first gripping head along said horizontal axis in dependence on such deviation as said first and second gripping heads are simultaneously moved along said horizontal axis in said direction.

4,157,027

SPOOL STRAIGHTENING APPARATUS

Robert J. Graham, 640 N. Meridian, Oklahoma City, Okla. 73107, and Jimmy D. Archer, Box 225U, Blanchard, Okla. 73010

Filed Jan. 3, 1978, Ser. No. 866,218
Int. Cl.[2] B21D *1/06*
U.S. Cl. 72—403 **25 Claims**



1. An apparatus for straightening a flange of a spool having a center longitudinal portion with a planar flange transversely mounted upon an end thereof, comprising:

a movable anvil, for engaging an inner planar surface of said flange; and

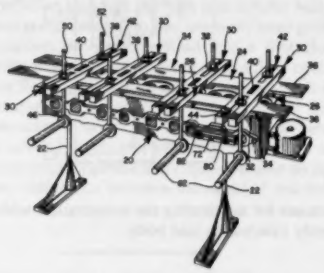
means for moving said anvil, in a direction transverse to said inner planar surface, into and out of engagement with said inner planar surface.

4,157,028

PORTABLE UNIVERSAL APPARATUS FOR USE IN PRESSURE TESTING ENGINE CYLINDER HEADS AND BLOCKS

George A. Moffett, III, 115 Stuart Dr., Vidalia, La. 71373

Filed Apr. 6, 1978, Ser. No. 893,979
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—49.7 **13 Claims**



1. Apparatus for use in the fluid pressure testing of an engine part having a cooling jacket with surface openings connected thereto, said apparatus including:

(a) a plurality of sealing members placed over the surface openings,

(b) retaining means engageable with said sealing members for holding the latter in position, and

(c) clamping means attached directly to the engine part and engageable with said retaining means,

(d) said clamping means including pairs of opposed shafts laterally of the engine part and extending between opposed surfaces thereof,

(e) a first set of clamp bars extending transversely of, and engaged with, one of the opposed surfaces of the engine part, said first set of clamp bars being connected to one end of said pairs of opposed shafts,

(f) a second set of clamp bars extending transversely of the other of the opposed surfaces of the engine part and superimposed on said retaining means,

(g) said clamping means further including means engageable with the other end of said pairs of opposed shafts for exerting force on said first and second sets of clamp bars in a direction to urge said sealing members into airtight engagement with the surface openings of the cooling jacket.

4,157,029

RHEOMETER

Jean-Paul Leca, Mantes La Jolie, and Alain Nardi, Bolbec, both of France, assignors to Societe Chimique des Charbonnages — CdF Chimie, Mazingarge, France

Filed Nov. 8, 1977, Ser. No. 849,593
Int. Cl.[2] B01N *11/04*
U.S. Cl. 73—55 **12 Claims**

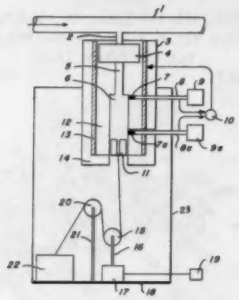
1. A rheometer for the continuous determination of the working-up capacity of a molten visco-elastic polymeric material, comprising:

(i) a non-return branch connected to a molten polymer line;

(ii) a fluid medium at regulated pressure;

(iii) a body, connected in series to and between said non-return branch and said fluid medium, including a fixed-speed pump, a first capillary tube situated downstream of said pump, a second capillary tube in series with said first tube and of a diameter less than or equal to that of said first tube, said second tube emerging in said fluid medium, and a pressure-sensor fitted at the inlet of each tube in order to

measure the pressure loss between the inlet of each tube and the fluid medium; and



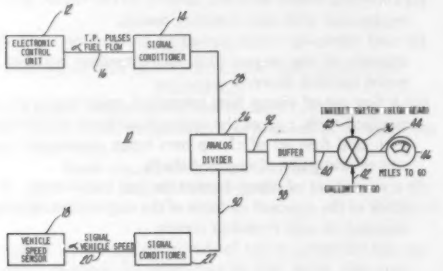
(iv) means for monitoring the temperature which are at least partly external to said body.

4,157,030

SYSTEM FOR DERIVING FUEL CONSUMPTION OF A VEHICLE

William A. Keely, Fremont, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 27, 1978, Ser. No. 881,476
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—113 **5 Claims**



1. A system for indicating the fuel comsumption for a vehicle relative to the operating conditions of the engine, the improvement comprising:

a fuel consumption sensing circuit for sensing the quantity of fuel being fed to the engine per unit of time and generating a fuel consumption signal in response thereto;

a speed sensing circuit for sensing the speed of the vehicle and generating a speed signal in response thereto including an integrating circuit and a speed signal hold circuit for holding said speed signal; and

divider means connected to said fuel consumption sensing circuit and said speed sensing circuit for dividing said speed signal by said fuel comsumption signal and generating an instantaneous distance being traveled per quantity of fuel signal;

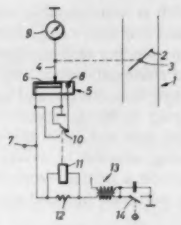
said divider means including a comparator circuit connected to said speed signal hold circuit and said fuel consumption sensing circuit, a speed signal eliminating circuit connected to said speed signal hold circuit for periodically eliminating said held speed signal, and an oscillator circuit connected to signal eliminating circuit for generating pulses, said pulses effective to cause said eliminating circuit to eliminate said held speed signal, said comparator circuit generating output pulses when said speed signal and said fuel consumption signal bear a preselected relationship, one to the other.

4,157,031

APPARATUS FOR INDICATING THE FUEL CONSUMPTION RATE OF AN INTERNAL COMBUSTION ENGINE

Ernst Fiala, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jun. 29, 1978, Ser. No. 920,497
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2731568
Int. Cl.[2] G01L *3/26;* **G01M** *15/00*
U.S. Cl. 73—113 **5 Claims**



1. A device for indicating the fuel consumption rate of an internal combustion engine comprising:

(a) potentiometer means having a sliding contact engaging resistance means, said resistance means having a substantially linear portion engaged by said contact when the engine is operating under partial to full load and a separate portion engaged by said contact when the engine is operating in the idling mode or the deceleration mode;

(b) means connecting said sliding contact with the fuel proportioning means of the engine for adjusting the position of said contact in accordance with the amount of fuel supplied to the engine;

(c) indicator means electrically connected to said sliding contact;

(d) a voltage source connected to said linear portion, and

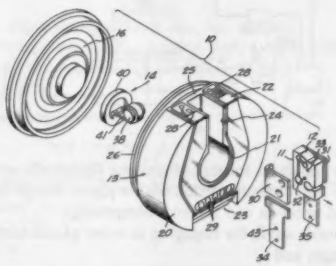
(e) means operable in response to engine speed connected between said voltage source and said separate portion for selectively supplying different voltages to said separate portion, depending upon whether said engine is in the idling mode or the deceleration mode, for indicating a higher or lower fuel consumption rate, respectively.

4,157,032

ELECTRICALLY ISOLATED STRAIN GAGE ASSEMBLY

Richard R. Schaberg, Ventura, Calif., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 10, 1978, Ser. No. 868,312
Int. Cl.[2] G01L *1/22, 9/04*
U.S. Cl. 73—141 A **8 Claims**



1. A force transducing apparatus, comprising:

a first flexure having a strain gage resistance circuit thereon;

an electrical isolation frame having an opening therein and a slot interconnecting with said opening;

means for mounting said first flexure within said slot;

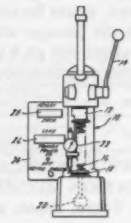
at least one extension member affixed to said first flexure, said member extending into said opening; and

force transmitting linkage means for applying a force to be transduced to said first flexure, said linkage means comprising an insulator rod secured to said at least one extension member, a coupling member secured to said rod, a force transmitting cap member and a second flexure secured to said cap and said coupling member, whereby forces applied to said cap member are resiliently transmitted to said first flexure and said resistance circuit.

4,157,033
SPRING TESTER

Daniel J. Shereda, Redford, and Tilak R. Sahni, Plymouth, both of Mich., assignors to Link Engineering Company, Detroit, Mich.

Filed Sep. 12, 1977, Ser. No. 832,736
Int. Cl.² G01L *1/04*
U.S. Cl. 73—161 **11 Claims**



1. A device for testing the force of a spring or other compressible object, comprising:

force transducer means for providing a signal representative of the force exerted by said spring;

height indicator means for providing a signal representative of the height of said spring;

compression means for compressing said spring to a height less than a first height;

first circuit means connected to said force transducer means and said height indicator means for providing and maintaining a first output signal representative of the signal from said force transducer means when the height of said spring corresponded to said first height, including first selector means that are selectably settable to a value which determines said first height; and

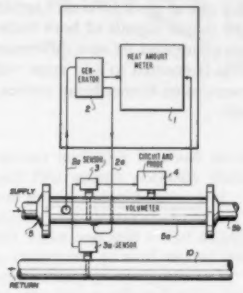
second circuit means connected to said force transducer and said height indicator means for providing and maintaining an output signal representative of the signal from said force transducer means when the height of said spring corresponded to a second height greater than said first height, including second selector means that are selectably settable to a value which determines said second height.

4,157,034
ELECTRONIC HEAT AMOUNT METER

Karl Büchele, Forchheim, Fed. Rep. of Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 725,144, Sep. 20, 1976. This application Dec. 21, 1977, Ser. No. 862,679
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1975, 2542025
Int. Cl.² G01K *17/18*
U.S. Cl. 73—193 R **12 Claims**

1. In an electronic heat amount meter, for a heating installation having a heat carrier medium supply line and a cooled medium return line, the heat amount meter including a computer operating on the analog principle, a volumeter, and electronic circuit means for connection to signal processing devices: the improvement comprising, in combination, a volumeter including thermal energy supply means and comprising at least one substantially unrestricted tubular body connected in series in said supply line and conveying therethrough the heat carrier medium to be measured; at least one first temperature sensor and at least one pressure head probe mounted on said tubular body and operatively associated with the heat carrier medium being supplied through said tubular body; first electronic elements connected to said pressure head probe and operable to convert the pressure head into a first electrical quantity proportional to the volumetric rate of flow of the heat carrier medium flowing through said tubular body; at least one second temperature sensor mounted on said return line and operatively associated with the cooled medium returning therethrough; second electronic elements connected to said first and second temperature sensors and operable to convert the temperature difference between the supplied and returned



medium into a second electronic quantity proportional to such temperature difference; said computer being connected to said first and second electronic elements and combining said first and second electronic quantities into a measure of the heat supplied to said heating installation; and an electric generator connected to and operable by said thermal energy supply means of said volumeter and supplying the electrical energy for operation of said heat amount meter; in which said thermal energy supply means of said volumeter comprises a second tubular body coaxially surrounding said first-mentioned tubular body and in radially spaced relation to the latter, said two tubular bodies defining therebetween a completely closed annular space receiving a secondary medium heated by the heat carrier medium; a thermogenerator constituting said electric generator; pipe means connecting said thermogenerator to said completely closed annular space for generation of electric energy by the heat of said secondary medium; and transformer means connected to said thermogenerator and operable to convert the generated electrical energy into operating potentials applied to said heat amount meter.

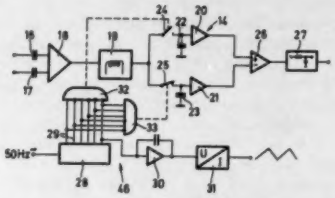
4,157,035
INDUCTIVE FLOW METER

Friedhelm Doll, Hoffnug 16, 5632 Wermelskirchen, and Jacob Rolff, Auf dem Postberg, 5158 Horrem, both of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 749,331, Dec. 10, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 887,877
Claims priority, application Fed. Rep. of Germany, May 6, 1976, 2619971; May 12, 1977, 2721430
Int. Cl.² G01F *1/58*
U.S. Cl. 73—194 EM **13 Claims**

1. An inductive flow meter comprising a current source and at least one solenoid generating in the flow region an alternating magnetic field and a pair of electrodes connected to an evaluation circuit, characterized in that the current source

provides to the solenoid a current linearly rising and falling in time, so that the generated magnetic field and the resultant electrode voltage both alternately increase and decrease linearly in time, that the evaluation circuit has a first voltage sample and hold circuit controlled to sample and store, during each period of the electrode voltage, a value in the vicinity of the upper peak value and a second voltage sample and hold



circuit to sample and store during each period of the electrode voltage, a value in the vicinity of the lower peak value, and that the evaluation circuit has a difference amplifier and a mean value former, the output signals of both voltage sample and hold circuits being supplied to said difference amplifier the output of which is connected to said mean value former, the output of said mean value former being connectable to a measuring instrument.

4,157,036

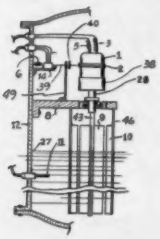
LEVEL SENSOR FOR STORED FLUIDS AND PARTICULATE MATERIAL

Gilbert Kivenson, 22030 Wyandotte St., Canoga Park, Calif. 91303

Filed Feb. 17, 1978, Ser. No. 878,678

Int. Cl.[2] G01F *23/22*

U.S. Cl. 73—290 R **5 Claims**



1. An apparatus for detecting, remotely indicating and controlling the level of materials contained in walled vessels at varying temperatures comprising in combination:

a. means for rotating a vertically oriented and elongated body through said materials;

b. means for making measurements of the resistance to motion encountered by said vertically oriented and elongated body as it rotates and for converting said measurements to equivalent signals;

c. means for the transmission of said signals to indicating and control devices positioned externally to said vessels;

d. means for the compensation of temperature induced changes in the said resistance to motion offered by said materials.

4,157,037

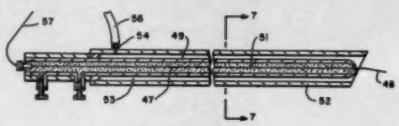
APPARATUS AND METHODS FOR CONTROLLING THE FEEDING OF WET MATERIALS

Edward E. Ross, San Rafael, Calif., assignor to Del Monte Corporation, San Francisco, Calif.

Division of Ser. No. 782,924, Mar. 30, 1977, Pat. No. 4,122,875. This application Mar. 30, 1978, Ser. No. 891,727

Int. Cl.[2] G01F *23/24*

U.S. Cl. 73—304 R **8 Claims**



1. Apparatus for sensing a change in the level of the upper surface of a mass of moist or wet material comprising a downwardly extending electrically conductive probe disposed above the upper surface of the material, a housing surrounding the probe and spaced from the same, the housing forming a gas flow passage generally surrounding the probe and open about the probe at its lower end, means for continuously supplying a stream of gas through the passage whereby the stream discharges downwardly about the probe, and electrical means connected to the probe serving to indicate contact of the material with the probe.

4,157,038

LIQUID METER WITH AN ENLARGED RANGE OF INDICATION MECHANISM

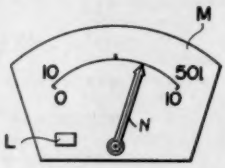
Harushige Yamamoto, Tokyo, Japan, assignor to Niles Parts Co., Ltd., Japan

Filed Feb. 22, 1978, Ser. No. 880,179

Claims priority, application Japan, Apr. 28, 1977, 52/054498[U]

Int. Cl.[2] G01F *23/10*

U.S. Cl. 73—313 **9 Claims**



1. A liquid meter with an enlarged range of indication mechanism for indicating the residual quantity of fuel in a container, comprising the combination of:

a power source;

a fuel meter having one end in electrical circuit with the power source;

a fuel sender gage which includes a plurality of serially arranged separate resistors arranged on said gage, one end of each resistor of said plurality of resistors being directly connected to the other end of the fuel meter, and a conductor physically arranged on said fuel sender gage adjacent to at least one pair of the plurality of resistors so that one end of the conductor is electrically connected to the power source, and the other end is arranged so that it is connected to one of said pair of resistors at or below a first specific position representing a first level and free from connection to the other of said pair of resistors above said specific position, a float responsive to the level of the residual quantity of fuel in said container which includes a plurality of electrically-connected contacts directly connected to the float and in circuit with each other each connected to a source of reference potential, said float

being located on the fuel sender gage and having its contacts arranged relative to the resistors and to the conductor on the fuel sender gage to cause said resistors in circuit with the fuel meter to be changed over one to another through one of said contacts moving with the float at said first specific position of the float and to make electrical contact between one of said contacts and said conductor when said changeover is effected; and

a warning indication device connected to the conductor and to the power source for indicating when said resistors have been changed over one to another.

4,157,039

DETECTION OF THE TEMPERATURE OF SHEET OR STRIP MATERIAL

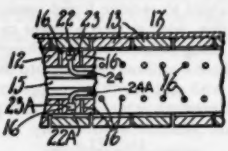
George T. F. Kilmister, Christchurch, and Douglas J. Thomas, Poole, both of England, assignors to Loewy Robertson Engineering Company Limited, Poole, England

Filed Apr. 19, 1976, Ser. No. 678,051

Claims priority, application United Kingdom, May 12, 1975, 19777/75

Int. Cl.[2] G01K *1/16*

U.S. Cl. 73—345 **9 Claims**



7. Apparatus for detecting width-wise temperature variation of a moving strip, comprising:

(a) an arbor;

(b) a plurality of heat-conducting rotors surrounding the arbor at axially spaced positions, each rotor having an internal diameter greater than the arbor diameter;

(c) conduits to supply gas under pressure between the arbor and each of the rotors, whereby each rotor is carried on a gas bearing;

(d) for each of a plurality of the rotors, temperature responsive means carried by the arbor and arranged to receive heat transmitted by the respective rotor towards the arbor, and yield individual indications of the temperature at said spaced locations so as to permit the detection of differences in said temperature between said locations, and a pressure transducer to detect the gas pressure within the respective rotor-arbor space and hence the tension of that part of the strip engaged by the respective rotor; and

(e) a modifying circuit to which the temperature responsive means and the pressure transducer of the same rotor are connected and which is arranged to modify the signal of the pressure transducer by the signal from the temperature responsive means.

4,157,040

APPARATUS FOR COLLECTING PYROLYSATES FROM A GAS-COOLED DYNAMOELECTRIC MACHINE

Sterling C. Barton, Scotia; Chester C. Carson, Ballston Spa, and Allen D. Albert, Saratoga, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 639,438, Dec. 10, 1975, abandoned. This application Jan. 10, 1978, Ser. No. 868,366

Int. Cl.[2] G01N *1/22*

U.S. Cl. 73—421.5 R **6 Claims**

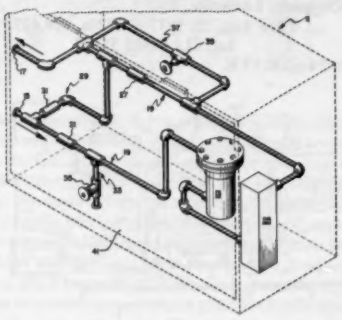
1. An apparatus for collecting thermal decomposition products given off into a dynamoelectric machine gas coolant comprising:

a gas inlet and a gas outlet interconnected by a conduit having a collector disposed therein; said conduit having an inlet solenoid valve upstream from said collector and an outlet solenoid valve downstream from said collector;

an inlet purge line interconnecting the upstream side of the inlet valve with the downstream side of the outlet valve; said line having a purge solenoid valve therein;

a collector purge inlet line connected on the downstream side of said inlet valve; and,

a bypass line having an inlet end connected to the upstream side of said outlet valve and an outlet end connected to the gas outlet;



an electrical circuit including first and second time delay switches; said first switch normally closed being connected to said purge solenoid valve; and,

a timer included in said electrical circuit for actuating said inlet solenoid valve and said outlet solenoid valve, said timer being connected to said second switch which is normally open whereby energization of said electrical circuit causes the purge solenoid valve to open immediately and then close after a time delay whereas the normally closed inlet solenoid valve and the outlet solenoid valve are opened after the time delay for a time period set in the timer.

4,157,041

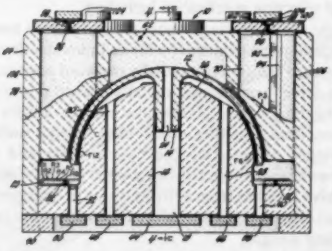
SONIC VIBRATING BELL GYRO

Edward J. Loper, Jr., and David D. Lynch, both of Santa Barbara, Calif., assignors to General Motors Corporation, Detroit, Mich.

Filed May 22, 1978, Ser. No. 908,548

Int. Cl.[2] G01P *9/04*; G01C *19/56*

U.S. Cl. 73—505 **10 Claims**



1. A vibratory rotation sensor comprising a resonator capable of sustaining a vibration pattern in a plane perpendicular to an input axis, means supporting said resonator along said input axis, means responsive to the phase of components of resonator motion along first and second axes perpendicular to said input axis and separated by a predetermined angle for applying forces to said resonator to eliminate any phase difference between the components of resonator motion along said first and

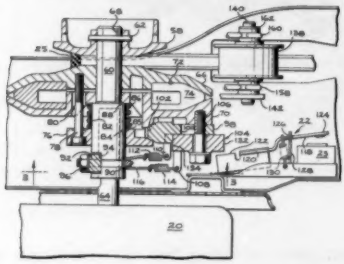
second axes to thereby maintain resonator motion at a single frequency and phase regardless of pattern location.

4,157,042

PULLEY DRIVE SYSTEM

Stephen L. McMillan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 22, 1977, Ser. No. 826,427
Int. Cl.[2] F16H 55/52
U.S. Cl. 74—230.17 E 6 Claims



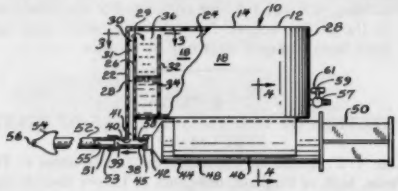
1. A two speed pulley drive system comprising:
(a) a drive member,
(b) a drive pulley assembly on said drive member having;
(i) a first half pulley fixed on the drive member,
(ii) a second half pulley rotatable with the drive member and axially movable on the drive member relative to the first half pulley,
(iii) a collar mounted concentrically of and rotatable with the drive member, said collar having a bearing surface thereon and being axially movable relative to the drive member and secured to the second half pulley,
(iv) a base member secured to the drive member and rotatable therewith,
(v) a spring having one end bearing on the collar and the other end bearing on the base member,
(vi) flyweights located between the second half pulley and the base member,
(c) a driven pulley assembly,
(d) a belt coactively connecting said pulley assemblies,
(e) a speed selection mechanism including,
(i) a single auxiliary weight mounted on the base member for rotational movement therewith and movable from a radially inward position to a radially outward position relative to the drive member, said radially inward position engaging a bearing surface of the collar and the radially outward position disengaged from the collar bearing surface,
(ii) a trigger mounted on the base member and rotatable therewith, said trigger being pivotal radially outward of the drive member from a first position in engagement with the auxiliary weight to a second position disengaging the auxiliary weight,
(iii) a control member movable between first and second positions and means for so moving said control member, said control member in its first position being remote from the rotary path of said trigger, said control member in its second position being in the rotary path of said trigger only when said trigger is in its first position to pivot said trigger to its second position and thereby allow said auxiliary weight to be disengaged from the bearing surface of said collar.

4,157,043

MAXIMUM PRESSURE MANOMETER

James J. Peterson, Palatine, and James P. Cianci, Cary, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Mar. 13, 1978, Ser. No. 885,835
Int. Cl.[2] G01L 7/18
U.S. Cl. 73—709 14 Claims



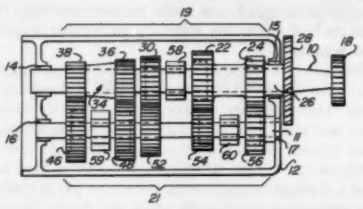
1. A manometer for recording maximum pressures from a liquid supply comprising, a closed air chamber, an elongated channel communicating with said supply adjacent a lower end of the channel and communicating with the chamber through an opening adjacent an upper end of the channel, and an overflow cavity positioned to receive liquid passing through said channel and opening, with at least a lower cavity portion of substantial height being isolated from the channel and chamber to collect liquid therein without passage into the chamber, and means associated with said cavity lower portion for determining the maximum pressure achieved by the supply relative to the height of liquid collected in the cavity.

4,157,044

FIVE SPEED MOTORCYCLE TRANSMISSION

Johnny W. Peltz, 7491 Newton Way, Westminster, Colo. 80300

Filed Jun. 13, 1977, Ser. No. 806,187
Int. Cl.[2] F16H 3/08
U.S. Cl. 74—356 12 Claims



1. A motorcycle transmission system for connecting a cycle motor to a drive chain extending rearwardly to and operably connected to a rear wheel of the motorcycle, and comprising:
a housing having a chamber defined by a bottom wall, a pair of spaced parallel side walls extending transversely relative to the drive chain and a pair of end walls extending parallel relative to the drive chain;
a one piece continuous drive shaft mounted in said chamber adjacent to and extending parallel with one of said side walls with one end rotatably mounted in one of said end walls and the other end rotatably mounted in the other one of said end walls and having an end portion extending outwardly from said chamber beyond the other one of said end walls;
a one piece continuous countershaft mounted in said chamber in spaced parallel relationship to said main drive shaft and located adjacent the other one of said side walls with one end rotatably mounted in one of said end walls and the other end rotatably mounted in the other of said end walls;
transmission gear members mounted on said main drive shaft and said countershaft for selective engagement and pro-

viding a direct gear drive ratio, four lower gear drive ratios, and an overdrive gear ratio;

an elongated drive hub rotatably coaxially mounted on said main drive shaft next adjacent said end portion and extending through said other one of said end walls and including an inner portion within said chamber and an outer portion on said end portion of said main drive shaft;

a motor driven input gear mounted on said end portion of said main drive shaft beyond said outer portion of said drive hub;

an output chain sprocket mounted on said outer portion of said drive hub for rotation therewith relative to said main drive shaft and being located next adjacent said other one of said end walls;

a main drive gear drivably mounted on said inner portion of said drive hub;

a first overdrive gear drivably mounted on said inner portion of said drive hub and being located next adjacent said other one of said end walls;

a second overdrive gear mounted on said countershaft next adjacent said other one of said end walls in constant meshing engagement with said first overdrive gear; and

shift means operatively associated with said transmission gear members for enabling selection of the various gear drive ratios including selection of the overdrive gear ratio without axial displacement of any of said drive hubs, said main drive gear, said first overdrive gear and said second overdrive gear.

4,157,045

LUBRICATING SYSTEM FOR AN OIL SEAL IN A DIFFERENTIAL GEAR

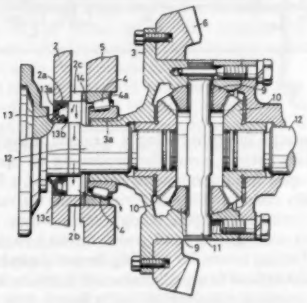
Takaaki Suzuki, Obara, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Aug. 1, 1977, Ser. No. 820,898

Claims priority, application Japan, Aug. 3, 1976, 51-103619[U]

Int. Cl.[2] F16H *1/44*

U.S. Cl. 74—713 **2 Claims**



1. A lubricating system for an oil seal means in a differential gear comprising a differential carrier having a pair of bosses, a pair of spacers, a differential case and a ring gear therein and a pair of side shafts penetrating both sides of said differential carrier, said oil seal means comprising an oil seal between each of said side shafts and said differential carrier in an oil-tight manner, a recess in the upper portion of each of said spacers to facilitate the inflow of lubricating oil into a space defined by each of said side shafts, said bosses, said spacers and said differential case, and each of said spacers comprises a weir for collecting oil flowing from said recess into the interior of the corresponding boss between each of said weirs and said oil seals.

4,157,046

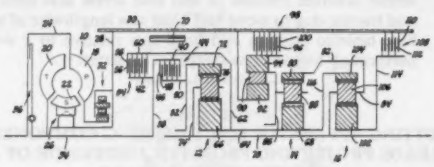
FOUR SPEED POWER TRANSMISSION WITH OVERDRIVE

John J. O'Malley, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 12, 1978, Ser. No. 895,630

Int. Cl.[2] F16H *57/10*

U.S. Cl. 74—763 **3 Claims**



1. A power transmission for a wheeled vehicle having a prime mover comprising: input means adapted to be connected to the prime mover; output means adapted to be connected to drive wheels of the vehicle; first selectively operable friction clutch means drivingly connected to said input means; second selectively operable friction clutch means drivingly connected to said input means; three simple planetary gear means including first, second and third sun gears respectively, first, second and third ring gears respectively, first, second and third planet carrier means respectively, and pinion gears rotatably mounted on each of said carrier means meshing with the respective sun gear and ring gear; first drive means interconnecting said second clutch means, said first sun gear, said second sun gear and said third ring gear; second drive means interconnecting said first carrier means, said second ring gear means, said third carrier means and said output means; first brake means selectively operable to prevent rotation of said second carrier means in at least one direction; second brake means selectively operable to prevent rotation of said first drive means; and third brake means selectively operable to prevent rotation of said third sun gear; said first friction clutch means being connected to said first ring gear; said first clutch means and said third brake means being operated to condition said first and third planetary gear means to establish an overdrive ratio between said input and output means.

4,157,047

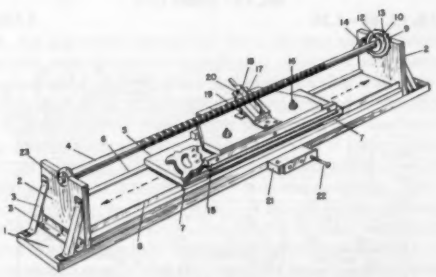
HAND SAW WORK HOLDER

Alex Dudley, 220 Edgewood Rd., Lansing, Mich. 48910

Filed Apr. 19, 1977, Ser. No. 782,729

Int. Cl.[2] B23D *63/00*

U.S. Cl. 76—76 **2 Claims**



1. A hand saw work holder comprising in combination:

a. an elongated base table of sufficient length to accommodate a hand saw, a vertical panel at each end of said base table, each panel supporting the end of a lead screw in a ball bearing saddle,

b. a traversing table mounted on said base table for sliding

movement lengthwise of said base table on guides attached to said base table,

c. a clamp means for holding said hand saw mounted on said traversing table, and means for releasably locking said hand saw in operable position in said clamp means,

d. a tracing dog mounted said clamp means, means on said tracing dog for engaging a groove in said lead screw, means for biasing said engaging means against said lead screw, wherein rotation of said lead screw acts through said tracing dog to move said hand saw lengthwise of said base table to position said hand saw relative to a work performing tool such as sharpener or setter.

4,157,048

CUTTING APPARATUS FOR TRIMMING COMPONENT LEADS PROJECTING FROM THE UNDERSIDE OF A PRINTED WIRING BOARD

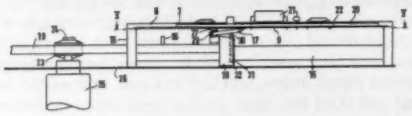
Alfred Lemmer, Machtlfingerstrasse 24, 8000 Munich 70, Fed. Rep. of Germany

Filed May 1, 1978, Ser. No. 901,787

Claims priority, application Fed. Rep. of Germany, May 27, 1977, 2724143

Int. Cl.[2] B26D *1/08*; H05K *13/06*

U.S. Cl. 83—579 **16 Claims**



1. A cutting apparatus for trimming the leads of the components mounted on a printed wiring board which project from its underside, said apparatus comprising a receiving frame for the wiring board, a cutting plate which is disposed on the receiving frame and is provided with perforations through which the leads of the circuit board extend, a knife, knife supporting means for supporting said knife to be slidingly disposed on the underside of the cutting plate, and drive means for moving said knife in the longitudinal direction of the frame, said knife comprising a plurality of knife sections arranged side by side and mounted for free omnidirectional movement within predetermined limits.

4,157,049

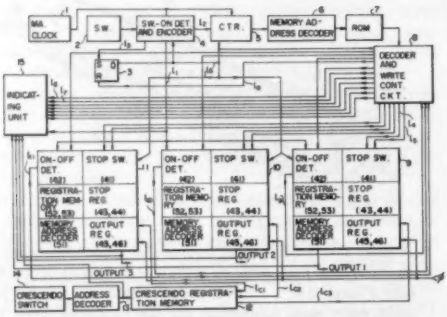
ORGAN PERFORMANCE SUPPORTING DEVICE

Hironori Watanabe, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Setsakusho, Hammatsu, Japan

Filed Oct. 28, 1977, Ser. No. 846,515

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.24 **5 Claims**



1. A performance supporting device for organs, comprising:

means for detecting ON signals of actuating switches of combination units to provide control code signals;

means for setting signals indicating the individual operative states of the switches by the switch-ON signals;

a first read-only memory having stored therein coded control signals necessary for presetting and selection of registrations and selectively reading out therefrom the coded control signals in response to the detected control code signals;

means for decoding the contents of the first read-only memory to produce control signals;

a registration memory composed of a writable memory capable of storing therein a plurality of registrations and a second read-only memory having stored therein registrations;

a first register supplied with a signal from a stop switch and reading out the registration memory in a predetermined operative state to store a registration pattern and the ON/OFF state of the stop switch, the first register having the function of changing its content by the stop switch for setting a desired registration pattern by the stop switch, the output of the first register being applied to the input of the writable memory for storing therein a plurality of registration patterns by a set of stop switches; and

means for indicating the state of each of the combination units and the ON/OFF state of the stop switch.

4,157,050

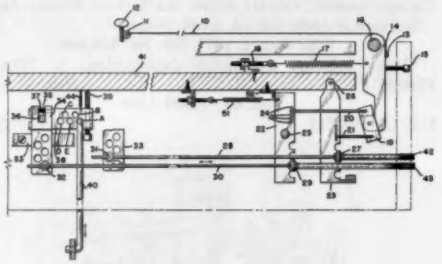
PEDAL GUITAR

Ronald T. Lashley, Burlington, N.C., assignor to Emmons Guitar Company, Inc., Burlington, N.C.

Filed Jun. 6, 1977, Ser. No. 803,588

Int. Cl.[2] G10D *3/14*

U.S. Cl. 84—312 P **12 Claims**



1. An apparatus for split-tuning a stringed musical instrument comprising: string means for producing an open condition tone, an open condition tone adjusting means, a first pedal means pivotally connected to said string means for varying the pitch of said string means producing a second tone, a second tone adjusting means, a second pedal means pivotally connected to said string means for varying the tonal pitch opposite to that imposed by said first pedal means and producing a third tone, a third tone adjusting means, and a fourth tone adjusting means for split-tuning said string means.

4,157,051

INDICATING ORGAN STOP TABLET

Richard H. Peterson, 11748 Walnut Ridge Dr., Palos Park, Ill. 60464, and Richard W. Jensen, 583 Fay Ave., Elmhurst, Ill. 60126

Filed Jun. 27, 1977, Ser. No. 810,136

Int. Cl.[2] G10B *3/10*

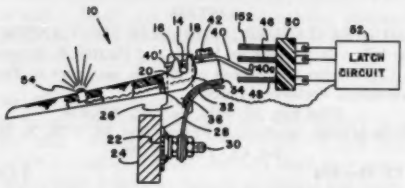
U.S. Cl. 84—343 **6 Claims**

1. An indicating stop tablet system for an organ having a plurality of stops comprising, in combination:

an array of a like plurality of pivotally mounted stop tablets each of which is spring-biased to be returned to a neutral

position following either upward or downward movement of the tablet, each of said tablets having a light emitting diode mounted thereon, and each having an electrical contactor secured thereto to be movable with upward and downward movement of the tablet,

first circuit means associated with each of said stop tablets including first and second stationary contacts arranged to be engaged by said contactor in response to downward and upward movement, respectively, of said tablet and a latching circuit connected to said stationary contacts and operative to be latched into a first of two stable states in response to momentary engagement of said contactor with one of said stationary contacts and to be latched into the second of said two stable states in response to momentary engagement of said contactor with the other of said stationary contacts, said first circuit means being operative in response to said latching circuit being latched in said first stable state to turn on the organ stop associated with an operated stop tablet and to energize the light emitting diode mounted on the operated stop tablet, and



operative in response to said latching circuit being latched in said second stable state to turn off the organ stop associated with an operated tablet and to de-energize and thereby extinguish the light emitting diode mounted on the operated stop tablet,

a combination piston operative between an "off" and an "on" position,

second circuit means associated with said piston connected to a preselected plurality of said first circuit means and operative in response to said piston being held in its "on" position to toggle the latching circuits thereof to their first stable state,

pulse generating means operative in response to initial actuation of said piston to its "on" position for generating a pulse of shorter duration than the time a piston is normally held in its "on" position, and

means for applying said pulse to the said first circuit means associated with all of said plurality of stop tablets for toggling the latching circuits associated with all of the non-selected stops to their second stable state.

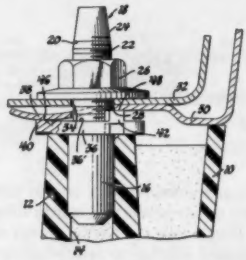
4,157,052

SELF-LEVELING STUD

Frederick C. Kulka, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1977, Ser. No. 849,025
Int. Cl.² F16B *19/00, 23/00*
U.S. Cl. 85—9 R **2 Claims**

1. A stud fastener for attaching one body member which rigidly supports the stud fastener to an apertured second body member having surface irregularities presenting raised and lowered portions from its general planar extent, comprising: a non-rotatable stud with an elongated body including a first end portion projecting into the one body member for gripping engagement and support thereby establishing a substantially fixed angular orientation therewith with the stud fixed against rotation, an opposite second end portion adapted to extend through the aperture in the second body member and being threaded to accept a nut fastener adapted to contact a first surface of the second body member, a radially extending collar portion between the first and second end portions having a planar surface perpendicular to the stud axis adjacent another surface of the second body member opposite to the nut-engaging first surface, a plurality of circumferentially spaced contact pad portions integral with said collar portion located peripherally along the collar edge and adapted to engage the other surface of the second body member as the collar portion is moved thereagainst, said pad portions defining surfaces offset away from said planar surface of said collar portion formed by



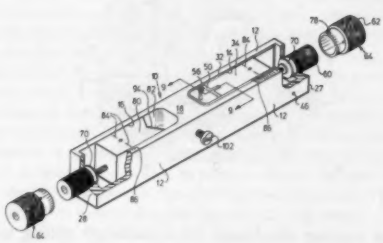
a localized application of a force so as to bodily move in a shearing manner the pad portions away from said planar surface, leaving a connecting portion with the collar portion sufficient to yieldingly resist return movement to the pre-shear configuration as the offset surfaces engage and provide for said planar surface to be drawn at least partially against said second body member.

4,157,053

ADJUSTABLE CHARGE BAR

Peter von Trnkoczy, Suite 1008, 55 Maitland St., Toronto, Ontario, Canada (M4Y 1C9)

Filed Mar. 23, 1978, Ser. No. 889,330
Claims priority, application Canada, Aug. 5, 1977, 284210
Int. Cl.² F42B *33/02*
U.S. Cl. 86—33 **4 Claims**

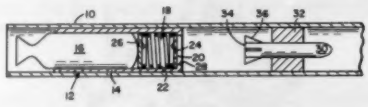


1. An adjustable charge bar for a shotgun shell reloading machine, said charge bar including an elongated body having longitudinally spaced powder and shot receiving slots open at the top and bottom of the body, a longitudinally movable slider in each slot forming variable volume powder and shot receiving chambers respectively with an inner end of the respective slot, an adjusting nut rotatably mounted at each end of the body and threadingly engaged by a rod extending from a respective slider such that rotation of the nut adjusts the longitudinal position of the respective slider in the body and thereby varies the volume of the respective chamber, each nut having a core portion into which the respective rod extends in threading engagement and a sleeve portion carrying scale markings alignable with a reference marking on the body, the sleeve portion being capable of assembly into fixed relationship with the core portion, after the respective slider has been moved to a predetermined position by rotation of the core portion, to position the scale markings on the sleeve part in a desired relationship with the reference marking on the body.

4,157,054
HYPERVELOCITY ROCKET SYSTEM WITH VELOCITY AMPLIFIER

Bernie J. Cobb, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 17, 1978, Ser. No. 887,589
Int. Cl.[2] F41F *1/00*
U.S. Cl. 89—8 **5 Claims**

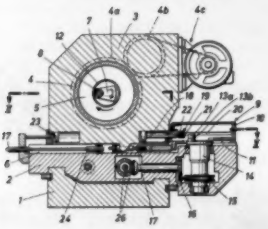


1. A rocket system comprising: a launch tube, a projectile mounted by sabot means within said launch tube, and a rocket mounted in said launch tube and having energy absorber means at one end in spaced relation to said projectile, said energy absorber means causing velocity amplification to be imparted to said projectile by a momentum transfer between the rocket and the projectile when the rocket has been fired.

4,157,055
COPYING ATTACHMENT FOR CRANKSHAFT MILLING MACHINE

Otto Marzy, Steyr, Austria, assignor to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

Continuation-in-part of Ser. No. 796,702, May 13, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,407
Claims priority, application Austria, May 21, 1976, 3749/76
Int. Cl.[2] B23C *1/18*
U.S. Cl. 409—113 **11 Claims**



1. A copying attachment for a crankshaft milling machine which comprises a machine bed having a longitudinal axis, a longitudinal carriage mounted on the machine bed for movement along the longitudinal axis of the machine bed, the longitudinal carriage having transverse guide means extending transversely to the longitudinal axis, a tool carriage mounted on the longitudinal carriage for movement in unison therewith along the longitudinal axis of the machine bed and for reciprocation relative to the longitudinal carriage along the transverse guide means, a cutter head mounted on the tool carriage for movement in unison with the tool carriage along the transverse guide means and for rotation about an axis, the cutter head having a cutting tool with inwardly directed cutting edges extending along and defining a cutting circle upon rotation of the cutter head, the cutting edges being capable of machining a workpiece rotating about the axis of rotation of the cutter head and surrounded by the cutting edges of the cutting tool, the copying attachment comprising

(a) a template connected to the tool carriage for reciprocation in unison therewith along the transverse guide means and having an edge portion along an arc of a circle having the same radius as the cutting circle and being centered about an axis,

(b) a roller mounted on the longitudinal carriage for movement in unison therewith along the longitudinal axis and for rotation about an axis parallel to the axis about which the arc of a circle of the template edge portion is centered,

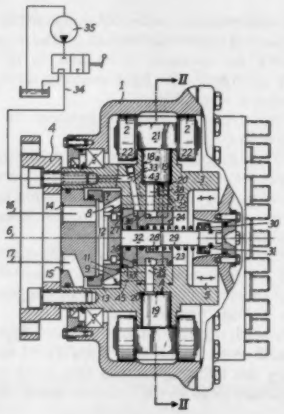
(c) revolving means for revolving the roller about a third axis parallel to, and spaced from, the axes of the arc of a circle of the template edge portion and of the roller, and

(d) a hydraulic actuator having one end connected to the tool carriage for movement in unison therewith along the longitudinal axis and extending in the direction of the transverse guide means, the actuator including a pressure-applying head connected to another end of the actuator remote from the one end, the pressure-applying head being arranged adjacent a side of the roller remote from the edge portion of the template and the actuator being operable to press the pressure-applying head into engagement with the remote side of the roller to force the roller towards the edge portion.

4,157,056
MULTI-CYLINDER HYDRAULIC MECHANISM

Bernard R. Allart, Crepy en Valois, and Patrick E. Ramousse, La Croix Saint Ouen, both of France, assignors to Poclain Hydraulics, Verberie, France

Filed Sep. 20, 1977, Ser. No. 835,404
Claims priority, application France, Sep. 21, 1976, 76 28323
Int. Cl.[2] F01B *13/06*
U.S. Cl. 91—491 **8 Claims**



1. A hydraulic mechanism, e.g. a motor or pump, comprising:

a cylinder block;

a cam;

means rotatably mounting said cam with respect to said cylinder block;

a plurality of cylinders disposed in said cylinder block;

a piston slidable in each cylinder and bearing on said cam;

a cylinder fluid distributor connected to said cam including a high pressure chamber for containing cylinder supply fluid and a low pressure chamber for containing fluid delivered from said cylinders, said chambers being connectable to said cylinders via ducts formed in said cylinder block and opening into a distribution surface of said distributor;

a piston-displacement selector disposed for movement coaxially with respect to the axis of rotation of said cam relative to said cylinder block, said selector being bounded by a cylindrical surface in contact with a cylinder block bore in said cylinder block into which said ducts open, said selec-

tor being movable axially in a straight line between first and second positions, and including blind grooves extending radially into said cylindrical surface of said selector;

said cylinders being divided into at least a first group and a second group, the cylinders of said first group being adapted to be blocked from communication with one of said two chambers by said piston-displacement selector when said selector is in its second position wherein said ducts of one of said cylinders in said first group of cylinders comprise the following three distinct portions:

a first duct portion which opens into the cylinder block bore on one end and which communicates with one of said grooves when said selector is in either said first or said second position, said first duct portion extending substantially parallel to said cylinder axis and being contained in a plane substantially parallel to a radial plane,

a second duct portion which has one end communicating with said cylinder and an opposite end which communicates with said cylinder block bore and with one of said grooves only when said selector is in its first position, said second duct portion being substantially parallel to the axis of said cylinder and contained in a plane substantially parallel to the radial plane distinct from the last mentioned radial plane, which contains the first duct portion, and

a third duct portion which connects said first duct portion to said to said fluid distributor; and

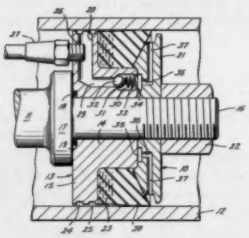
wherein said grooves are helical and have a pitch equal to the pitch of motion (likewise helical) of said selector which is similarly helical, and said third duct portion is substantially parallel to the axis of rotation and opens into said first portion without interfering with said second portion.

4,157,057

SINGLE ACTING PISTON

Stuart L. Bailey, Houston, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Nov. 18, 1976, Ser. No. 742,925
Int. Cl.[2] F01B *31/00*; F04B *39/00*
U.S. Cl. 92—87 **1 Claim**



1. A single acting pump piston for use in a pump cylinder comprising:

a piston head having a hub and an annular flange;

a piston rod removably connected to said piston head and extending from said cylinder;

an elastomeric seal ring disposed on said piston head hub and secured against said flange;

fluid means arranged to flush the wall of said cylinder on opposite sides of said seal ring, including separate passageways in said flange and said hub;

a check valve in one of said passageways arranged to be opened only during a back stroke of said piston; and,

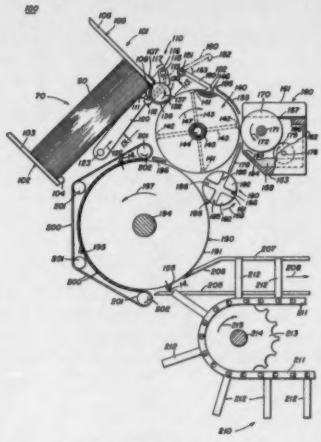
a plate member securing said seal ring on said hub, said plate member having radially extending passageways communicating with the passageway in said hub to conduct fluid to the surface of said cylinder adjacent said seal ring.

4,157,058

LONG SEAM GLUER

Walter H. Vogel, Hoffman Estates, Ill., assignor to Redington Inc., Chicago, Ill.

Filed Dec. 5, 1977, Ser. No. 857,263
Int. Cl.[2] B31B *1/54, 1/78*
U.S. Cl. 93—36.3 **38 Claims**



1. A long seam gluer for folding a carton blank into cylindrical form and forming a glued seam between the outer surface of a glue flap and a glue area on the inner surface of an overlying longitudinal side panel, said gluer comprising a magazine for holding a stack of the carton blanks on which a long glued seam is to be formed, feed mechanism for feeding carton blanks one at a time from said magazine in a predetermined direction with the longitudinal extent of the glue flap and the side panel normal to the predetermined direction, first folding mechanism for folding a first portion of the carton blank including the glue flap into a position overlying a remainder of the carton blank to leave exposed the outer surface of the glue flap, glue applying mechanism for applying a longitudinal body of glue to the glue flap as the glue flap is fed in the predetermined direction with the longitudinal extent of the glue flap normal to the predetermined direction, second folding mechanism for folding a second portion of the carton blank including the side panel into a position overlying a remainder of the carton blank to place the inner surface of the side panel over the body of glue on the glue flap, and pressing mechanism to press and hold the side panel against the body of glue on the glue flap until the body of glue has set firmly to secure the glue flap to the side panel.

4,157,059

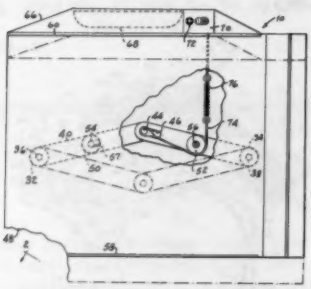
COPY SET SEPARATING TRAY FOR DOCUMENT COPIER

Max Schultes, Old Tappan, N.J., and Dietmar Eberlein, New City, N.Y., assignors to Savin Corporation, Valhalla, N.Y.

Filed Oct. 13, 1977, Ser. No. 841,742
Int. Cl.[2] F01B *19/00*
U.S. Cl. 93—93 C **14 Claims**

1. In a document copier operable to deliver successively along a delivery path a plurality of sets of copies of a single set of originals, each of said sets of copies being arranged in an order corresponding to that of the set of originals, apparatus comprising a receiving tray and means for mounting said receiving tray for manually controlled movement between first and second shifted positions in said delivery path to offset successive sets of copies relative to one another to permit the separation thereof, said mounting means mounting said receiving tray for movement between positions displaced transversely relative to said delivery path, said mounting means comprising a base member rigidly attached to said copier, a

pair of links, means for pivotally coupling one end of one link to one end of the other link, means for pivotally coupling the other ends of said links to one of said receiving tray and said base member at points spaced longitudinally on said delivery



path, and means for pivotally coupling said links at intermediate points to the other of said receiving tray and said base member at points spaced longitudinally on said delivery path, two of said coupling means also providing sliding coupling at one coupling point.

4,157,060

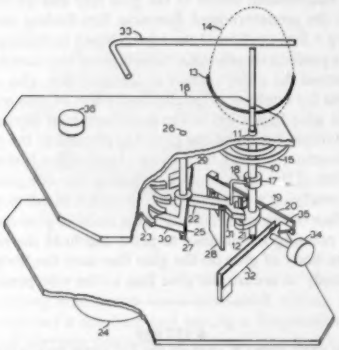
VISCOSITY CONTROLLED EGG COOKER

Robert W. Avery, Apt. 62, 4650 SW. 145th St., Beaverton, Oreg. 97005

Continuation of Ser. No. 640,743, Dec. 15, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 761,816

Int. Cl.[2] A23L *1/32*

U.S. Cl. 99—325 **15 Claims**



1. An apparatus for heating an egg in a cooking process comprising:

heating means for heating an egg to vary the degree of cooking of the contents of the egg;

sensing means for sensing the degree of cooking of said contents, said sensing means comprising means for sensing the viscosity of said contents to thereby sense the degree of cooking of said contends, and

indicating means responsive to said sensing means for indicating the degree of cooking of said contents, said indicating means comprising means for indicating a predetermined degree of cooking of said contents, and in which said indicating means includes means for indicating a predetermined threshold of the viscosity of said contents to thereby indicate the predetermined degree of cooking of said contents.

4,157,061

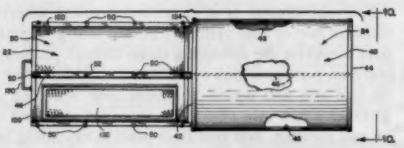
PROCESS AND APPARATUS FOR COOKING

Albert F. Margus, Jr., Boca Raton, Fla., assignor to Continental Seafoods, Inc., Secaucus, N.J.

Filed May 5, 1977, Ser. No. 794,033

Int. Cl.[2] A47J *27/08*

U.S. Cl. 99—352 **16 Claims**



1. An assembly for increasing heat exchange with respect to food to be cooked within a pressure vessel comprising:

a pressure vessel; and

a rotatable cylindrical food container within said pressure vessel and means for rotating said food container;

said food container being adapted so as to subject food within to the pressure and temperature atmospheric conditions applied within said pressure vessel and having a plurality of roller guide rails mounted on its exterior surface parallel to its principal axis and having a plurality of rollers mounted on said rails;

a cylindrical casing having a plurality of ribs mounted on its interior surface, said food container rollers receiving said ribs whereby said drum and said drum casing are disposed is co-axial alignment and the casing slideably receives the drum;

means for supporting said cylindrical casing including a first and second ring mounted within said pressure vessel in spaced-apart co-axial alignment and a plurality of roller bars extending between said first and second ring and rotatably mounted thereto for supporting said cylindrical casing, said roller bars disposed in substantially abutting relationship to said cylindrical casing; and

means for tumbling the food in said food container during rotation of said food container in order that at least a substantial part of the food is allowed to fall through ambient atmosphere within said food container so whereby heat exchange occurs between the food and the atmospheric conditions applied within said pressure vessel.

4,157,062

MOTOR-DRIVEN CITRUS FRUIT PRESS

Peter Ackeret, Küsnacht, Switzerland, assignor to Zyliss Zysset AG, Lyss, Switzerland

Filed Apr. 10, 1978, Ser. No. 895,093

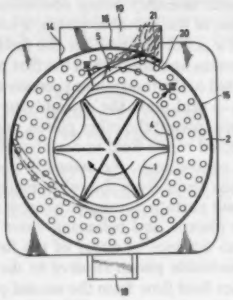
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1977, 2748683; Feb. 14, 1978, 2806096

Int. Cl.[2] A23N *1/00*; A47J *19/02*

U.S. Cl. 99—503 **9 Claims**

1. A citrus fruit press comprising at least one upstanding cone mounted coaxially on a cone shaft, said cone and said shaft being axially displaceable between an upper inoperative position and a lower operative position, spring means to bias said cone and said shaft into their upper position, comprising further an electric motor drivingly connected to said shaft via gearing means, an electric switch operatively connected to said motor, switch actuating means coupled to said shaft to switch on said motor in said lower position of said cone and said shaft, strainer means being provided beneath said cone, characterized in that each cone is connected with a strainer member revolving therewith, that a wiper element is allocated to each strainer member engaging the upper face thereof, said wiper element being stationary in said upper position of said cone and said shaft only, that delay means are provided to delay switching-off of said switch upon return of said cone and said shaft into their upper position by at least the time period necessary

for one complete rotation of said cone and said shaft, said wiper element wiping during said time period fruit flesh col-



lected on said strainer member revolving therebeneath from said upper strainer member face into a waste collecting container.

4,157,063

METHOD OF AND APPARATUS FOR ARRANGING TWINE AROUND A BALE

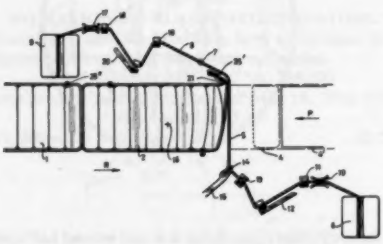
Gerhardus Minke, Appingedam, Netherlands, assignor to Ter Borg & Mensinga's Machinefabriek N.V., Appingedam, Netherlands

Filed Jun. 20, 1978, Ser. No. 917,208

Claims priority, application Netherlands, Jun. 21, 1977, 7706863

Int. Cl.[2] B65B *13/02*

U.S. Cl. 100—3 **17 Claims**



1. A method arranging twine around a bale formed by pressing in the bale chamber of a baling machine by means of a press plunger, in which twine is fed from two separate bobbins, a starting knot is laid between the twine ends and the twine is arranged in the bale chamber so as to extend across the front of the bale remote from the press plunger, the bale is pressed and the twine is drawn from the bobbins during pressing so that one piece of twine comes to lie along one longitudinal side of the bale and another piece comes to lie along the opposite longitudinal side, after completion of the bale one of the said pieces of twine is carried across the back of the bale by means of a needle which performs a reciprocating movement across the back of the bale through the press plunger, and, while pressure is maintained by the press plunger, two knots are laid in both pieces of twine, one knot for tying off the bale and another knot as a starting knot for a following bale, the time period of the formation of the said other knot unit its completion overlapping the time period of the formation of the said one knot until completion thereof.

4,157,064

MATERIAL PORTIONING APPARATUS AND METHOD

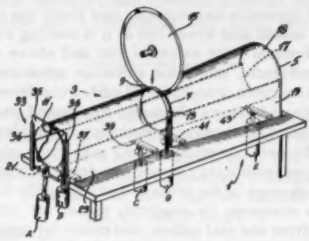
George Soga, Laval, Canada, assignor to Soga Packaging Machinery Co. Ltd., Montreal, Canada

Filed Aug. 19, 1977, Ser. No. 825,982

Claims priority, application United Kingdom, Aug. 19, 1976, 34639/76

Int. Cl.[2] B30B *13/00*

U.S. Cl. 100—39 **7 Claims**



1. Apparatus for portioning material of a given density automatically by volume, comprising:

a preforming stage having an adjustable volume; and

a weighing stage also having an adjustable volume to a final, predetermined volume;

said preforming stage comprising a generally funnel shaped member having an input end and an output end, the volume of the funnel being adjustable;

said weighing stage comprising a cylindrical shaped member having an input end and an output end, the volume of the cylinder being adjustable;

the output end of the preforming stage being disposed adjacent the input end of the weighing stage and separated therefrom by a gap.

4,157,065

JUICE EXTRACTOR

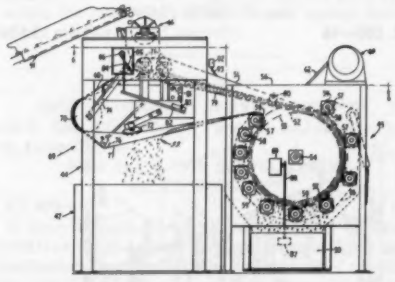
Konrad Schinko, Hanlons Rd., Bilpin, New South Wales, Australia (2758)

Filed May 19, 1976, Ser. No. 687,862

Claims priority, application Australia, Sep. 16, 1975, PC3180

Int. Cl.[2] B30B *15/30, 9/20, 9/24*

U.S. Cl. 100—45 **1 Claim**



1. A juice extractor apparatus comprising a liquid pervious continuous belt conveyor having a circumferential juice extractor run, a generally level upper run extending upstream from the circumferential juice extractor run and leading substantially tangentially to the top of the circumferential run and a lower generally level run below the upper run in spaced relation thereto and leading away from said circumferential run near the top thereof, means for continuously supplying to the upper run at a point spaced substantially from the circum-

ferential run produce from which juice is to be extracted, a juice collection receptacle disposed at the bottom of the circumferential juice extractor run, a pulp collection receptacle disposed beneath the lower run and spaced laterally of said circumferential run and juice collection receptacle, means connected with said continuous belt conveyor for driving it in one direction, means on the apparatus and engaging said upper run of the belt conveyor to fold said upper run upwardly and inwardly upon itself during its approach to the top of the circumferential extractor run so that the folded belt conveyor surrounds and encloses produce deposited on it, additional means on the apparatus and engaging said lower run of the belt conveyor to unfold said lower run as it is moving away from said circumferential juice extractor run and above said pulp collection receptacle, said juice extractor apparatus further comprising a rotatable drum inside of said circumferential juice extractor run and having a channeled rim shaped and sized to receive the folded belt conveyor enclosing the produce during passage of the belt conveyor around said drum, rollers disposed in spaced relationship around the drum for a major part of the circumference of the drum and engaging the folded belt conveyor to compress its contents, means for rotationally driving said drum and said rollers, said means for unfolding the belt conveyor comprising two guide wheels above and adjacent to said lower run and between the belt conveyor longitudinal edges and being laterally spaced to engage such edges and guide them along divergent paths, said belt folding means comprising at least one pair of guide wheels with the wheels of said pair disposed outwardly of the belt edges and between the ends of said upper run and at a lateral spacing substantially less than the normal belt width and engaging the belt edges and guiding them along convergent paths, said extractor apparatus further comprising stripper means adjacent to the belt unfolding means and engaging the upper surface of the lower run of the belt approximately centrally of the belt width to force the belt downwardly adjacent to said pulp collection receptacle, means operable in response to the amount of produce deposited on said upper run per foot of belt to maintain that amount of produce between preestablished limits, and additional means operable in response to juice level in said juice collection receptacle to control the rate of juice extraction.

4,157,066

PRESSES HAVING PLATEN LEVELING MEANS

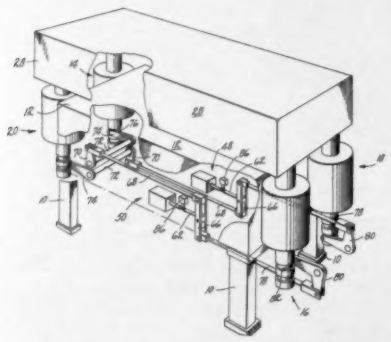
Frederick A. Pretty, Alveston, England, assignor to USM Corporation, Farmington, Conn.

Filed Apr. 19, 1978, Ser. No. 897,782

Claims priority, application United Kingdom, Apr. 22, 1977, 16726/77

Int. Cl.[2] B30B *15/24*

U.S. Cl. 100—46 **3 Claims**



1. In a press comprising a lower platen for supporting a workpiece, an upper platen relatively movable toward and away from the lower platen for effecting an operation on the workpiece, hydraulic means for thus moving one of the platens and including a first and a second piston-cylinder assembly, each having a first and a second port, the first assembly being operatively connected to a first portion of the movable platen, and the second assembly being operatively connected to a second portion of the movable platen, a source of fluid under pressure, and a collecting tank for the fluid, the improvement comprising means operable, when the first port of either assembly is connected to the fluid under pressure and the second port is connected to said tank, the assembly operates to move the movable platen toward the other platen, and, when the second port is connected to the fluid under pressure and the first port is connected to said tank, the assembly operates to move the movable platen away from the other platen, valve means for controlling said ports to determine relative approach and separation of the platens, and balancing valve means operable in response to an advance of either of the first and second portions of the movable platen relative to the other of said portions to restrict fluid flow from the second port of the assembly connected to the advanced portion of the movable platen thus to slow its movement and effect a compensating advance of the other of said portions of the movable platen.

4,157,067

FORM CYLINDER PROVIDED WITH FLEXIBLE PRINTING PLATES FOR ROTARY INTAGLIO PRINTING PRESSES

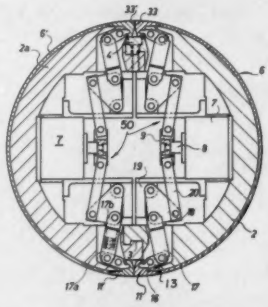
Max Dätwyler, Bleienbach, Switzerland, assignor to Firma Max Datwyler & Co., Switzerland

Filed Feb. 27, 1978, Ser. No. 881,543

Claims priority, application Sweden, Feb. 28, 1977, 7702198

Int. Cl.[2] B41F *27/06, 7/22*

U.S. Cl. 101—415.1 **10 Claims**



1. A form cylinder comprising first and second half cylindrical parts joined together to form a cylinder with an intermediate clamping mechanism receiving recess defined between said first and second half cylindrical parts and with diametrically opposite end recesses formed therebetween adjacent ones of said half cylindrical parts, each of said end recesses having a bottom surface defined by said half cylindrical parts, first and second flexible printing plates extending over respective first and second half cylindrical parts, first and second angle members for each printing plate, each having a first leg portion adapted to be connected to a respective end of each of said printing plates, and a second leg portion adapted to be supported on said bottom surface of each respective diametrically opposite end recess when in a clamping position, and clamping means disposed in an intermediate clamping mechanism receiving recess and comprising respective first and second driving piston and cylinder combinations for each of the respective first and second printing plates, a first toggle linkage connected between respective first and second piston and cylinder combinations and a respective first angle member of each plate and a second toggle linkage connected between the respective first and second piston and cylinder combinations and said second

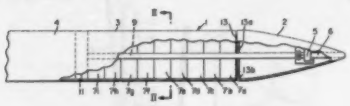
angle member of each plate, said first and second driving piston and cylinder combinations being effective to displace respective first and second angle members in a direction away from the associated end of the first and second printing plates to which they are attached in order to tension said printing plate and to engage said second leg portion on the associated bottom surface of each diametrically opposite end recess.

4,157,068

MISSILE FOR DISCHARGE TOWARDS A TARGET

Tore Rognmo, Kongsberg, Norway, assignor to A/S Kongsberg Våpenfabrikk, Norway

Filed Oct. 25, 1977, Ser. No. 845,445
Claims priority, application Norway, Oct. 26, 1976, 763653
Int. Cl.[2] F42C *11/04*
U.S. Cl. 102—69 11 Claims



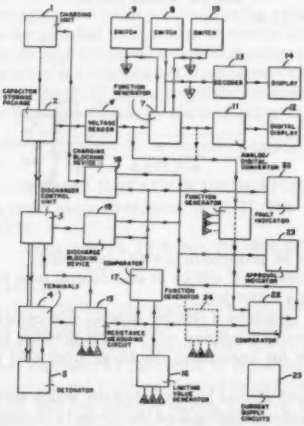
1. An missile for discharge towards a target, comprising a power source, an explosive charge, a release unit, a sensor means adapted to influence the release unit in response to certain conditions appearing during the flight of the missile towards the target, and a plurality of explosive elements which have their own power source, explosive charge, detonator unit, and sensor means, and which under the influence of the release unit are separated from the missile and independently thereof approach the target for under certain conditions sensed by the sensor means to detonate individually at a desired distance from the target, characterized in that the power source of each explosive element (*7a–7i, 8a–8f*) is a chargeable condensor battery which during the flight of the missile (**1**) is connected to and charged by the power source of the missile.

4,157,069

INITIATION OF BLASTING DETONATORS

Åke Gustafsson, and Jan Westberg, both of Gyttorp, Sweden, assignors to Nitro Nobel AB, Gyttorp, Sweden

Filed May 13, 1977, Ser. No. 796,690
Claims priority, application Sweden, May 18, 1976, 7605608
Int. Cl.[2] F42D *5/00*
U.S. Cl. 102—200 22 Claims



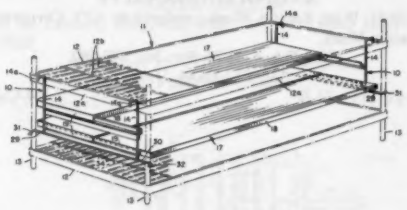
1. A method for the initiation of a number of electric detonators by means of a blasting machine of the type in which a capacitor is charged, level-sensing units measure the level of the charge, and detonators are initiated by the electric energy stored in the capacitor being supplied to the detonators, by firing after the intended charge level has been attained, said method comprising limiting the charge level of said capacitor in connection with firing in a limited range which follows the variations of the load between different initiation occasions in such a way, that the current impulse provided to each detonator assumes a value between a minimum and a maximum limit, and regulating said limits for each individual case of load within the operating range of the apparatus to suit the electrical and other physical characteristics of the detonators, so that safe initiation and a disturbance-free firing process are obtained.

4,157,070

AUXILIARY SHELVING ADAPTER

David F. Huempfner, Kewaunee; Floyd F. Mueller, and Claude G. Kanzelberger, both of Two Rivers, all of Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 11, 1977, Ser. No. 840,838
Int. Cl.[2] A47B *57/24*
U.S. Cl. 108—28 18 Claims



1. In combination with a shelf assembly having at least one generally rectangular structural shelf supported at opposite ends thereof by pairs of spaced end posts, at least one auxiliary shelf, and means for securely but removably suspending said auxiliary shelf beneath said structural shelf, said means comprising a pair of adapters adjacent opposite ends of said assembly, each adapter having a pair of spaced hangers extending along a plane parallel with a pair of said end posts and having hooks at the upper ends thereof engaging said structural shelf, bracket means extending between and secured to the hangers of each adapter for supporting one end of said auxiliary shelf, and abutment means adjacent the lower end of each adapter for engaging inboard surfaces of a pair of said end posts to brace and secure the lower end of such adapter against horizontal movement relative to said assembly.

4,157,071

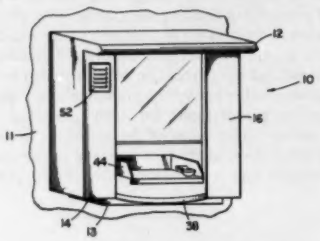
DRIVE-THROUGH SERVICE WINDOW

Donald E. King, Louisville, Ky., assignor to Ayr King Corporation, Louisville, Ky.

Filed Aug. 2, 1978, Ser. No. 930,330
Int. Cl.[2] E05G *7/00*
U.S. Cl. 109—19 6 Claims

1. A drive-through service window assembly for fast food restaurants or the like comprising a rectangular frame adapted for installation in an opening in an outside wall of a building, a hollow cylinder closed at its upper and lower ends and supported for rotation within said frame on its central longitudinal axis, said axis being disposed vertically within the frame, opposite arcuate portions of the cylinder sidewall being cut away to provide diametrically opposed access openings into the interior of the cylinder, a transverse wall extending chordally across the cylinder and intersecting the line of sight between said access oepings, a product serving member mounted in one of the cylinder segments formed by said transverse wall for movement along a diameter of said cylinder between a re-

tracted position in which the serving member is within the cylinder and an extended position in which the serving member extends outside the cylinder, and means accessible in the other of the cylinder segments for moving said member between said positions.

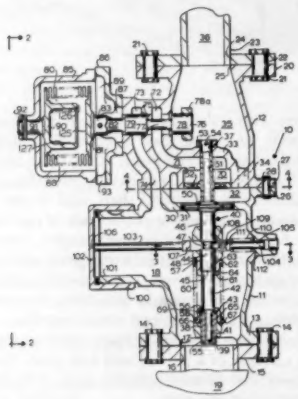


4,157,072

COMBINATION PRESSURE-VACUUM RELIEF AND ANTIPOLLUTION VALVE

Harold H. West, Seattle, Wash., assignor to APV Corporation, Seattle, Wash.

Filed Feb. 6, 1978, Ser. No. 875,282
Int. Cl.[2] B63B *25/08*
U.S. Cl. 114—74 R **24 Claims**



17. A combination venting and antipollution device for a shipboard liquid-storage tank having an opening at its upper end connected to a vent and overflow conduit having a vent opening at its upper end including in combination:

a closure wall in the conduit, dividing the conduit into a tank chamber on one side of the wall in direct communication with the tank through the tank opening, and a vent space on the other side of the wall in direct communication with the vent opening, said closure wall having a valve opening therethrough,

a valve closure means for normally closing said valve opening;

first relief means responsive to low pressure in the tank relative to that in the vent space for moving the valve closure means into a first open position, to admit air to said tank,

second relief means responsive to high pressure in the tank relative to that in the vent space, effective when said high pressure reaches a predetermined pressure differential above the vent space pressure to move the valve closure means into a second open position, to vent air from the tank, and

ambient pressure responsive means effective upon sinking of the ship to increase the pressure differential required to move the valve closure means into the second open position;

whereby after sinking of the ship the valve closure means remains closed unless tank pressure reaches an unusually high level relative to ambient pressure, thereby helping prevent outflow of a liquid cargo stored in the tank.

4,157,073

METHOD FOR SILENCING HALYARDS

Seymour Vall, 35 W. 81st St., New York, N.Y. 10024

Filed Dec. 21, 1977, Ser. No. 862,956
Int. Cl.[2] B63H *9/04*
U.S. Cl. 114—102 **6 Claims**

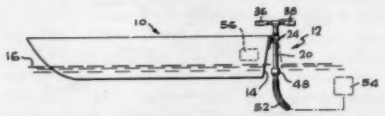
1. A method for restraining the halyards of a sailing yacht having shrouds on its mast so as to silence said halyards and prevent undue wearing periods of non-use, which method comprises providing an open-ended helical coil and installing said halyards and shrouds completely within the turns of said helical coil.

4,157,074

WATER JET PROPULSION DEVICE

Roy A. Sherwood, and Patricia E. Sherwood, both of 8424 Ranchito Ave., Panorama City, Calif. 91402

Continuation of Ser. No. 795,414, May 9, 1977, abandoned, which is a continuation of Ser. No. 655,478, Feb. 5, 1976, abandoned. This application Feb. 23, 1978, Ser. No. 880,620
Int. Cl.[2] B63H *11/00*
U.S. Cl. 115—12 A **9 Claims**



1. A water jet propulsion device comprising:

a central tube, a jet orifice in said central tube for radially emitting a water jet;

means for attaching a flexible hose to said central tube for continuously supplying water under pressure to said central tube for continuous discharge from said jet orifice; and

a cup-shaped shroud having sidewalls which surround said central tube and are spaced therefrom in the region of said jet orifice a distance sufficient to assure unrestricted full flow of water from said jet orifice at all times and positions, said central tube being rotatably and axially mov-

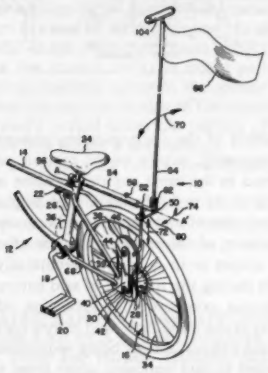
ably mounted with respect to said shroud so that said central tube can be moved into a non-propulsion first position, wherein the full flow out of said jet orifice is discharged against said shroud and said shroud axially redirects said full flow out of said jet orifice generally downwardly along the length of said central tube, and to a propulsion second position wherein said shroud is in non-interfering relationship with respect to flow out of said jet orifice to permit unrestricted water jet flow in the radial direction for propulsion.

4,157,075

BICYCLE SIGNAL DEVICE

John Kirvutza, 407 Lincoln Rd. North, East Rochester, N.Y. 14445

Filed Oct. 11, 1977, Ser. No. 840,558
Int. Cl.[2] B60Q *1/30*; B60R *5/00*
U.S. Cl. 116—56 **12 Claims**



1. A signal device operative to move to provide indication of the underway movement of a pedalled vehicle which has a frame supported by at least one wheel disposed about an axle attached to the frame, comprising:

signal means;

signal attachment means supportable by the vehicle frame for carrying the signal means for movement in an oscillatory pattern within a plane substantially parallel to the axle of the wheel; and

signal drive means connected to the signal attachment means for engaging a member of the pedalled vehicle rotatable when the pedalled vehicle is in motion to drive the signal means through the signal attachment means in said oscillatory pattern as a function of the movement of the rotatable member to provide indication of the underway movement of the pedalled vehicle by the oscillating signal means.

4,157,076

WHEEL ROTATION INDICATOR

Leo Roth, and Ursula Roth, both of 52-27 69th St., Maspeth, N.Y. 11378

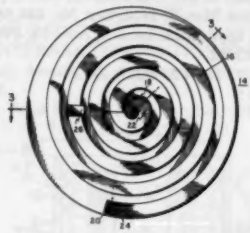
Filed Apr. 14, 1978, Ser. No. 896,387
Int. Cl.[2] G01P *13/02*
U.S. Cl. 116—215 **2 Claims**

1. A device which when secured to a non-horizontal rotatable wheel will display the position of rotation of the wheel with respect to a reference position, said device comprising:

a flat base securable to the center of the wheel;

a flat spiral shaped member parallel to and disposed above the base, said flat member having a central area at which the spiral terminates and a free end at which the spiral starts, the spiral path having a constant cross sectional area and having a radius which is constantly increasing;

means disposed between the base and the member to support the member above the base, said means engaging the member only at the central area and the free end; and



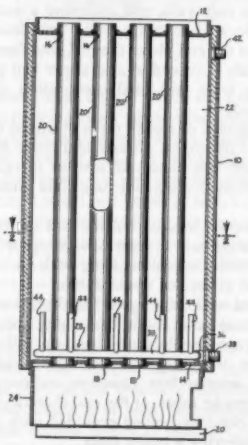
a loop slidably engaging the member and being movable there along to any position between the central area and the free end, said means preventing said loop from sliding off the member.

4,157,077

WATER HEATER

John R. Lindahl, Hwy. 12, P.O. Box 40, Cheap Hill, Tenn. 37035

Filed Nov. 25, 1977, Ser. No. 854,721
Int. Cl.[2] F22B *9/04*; F22D *7/04*
U.S. Cl. 122—159 **9 Claims**



1. A water heater comprising:

a watertight tank means having a plurality of flue tubes extending vertically from one end to the other;

a burner means mounted beneath said tank;

a hot water outlet means mounted in the top portion of said tank;

an agitator assembly means mounted in the bottom portion of said tank, said agitator assembly means including a ring-shaped tubular member dimensioned to fit between the outer row of flue tubes and the inside wall of said tank means in the bottom thereof, said ring-shaped tubular member having a plurality of openings in a side thereof so that water flowing from inside said member into said tank will flow in a substantially horizontal direction towards the central portion of the tank in a plane which is closely adjacent to the tank bottom; and

a connector means for connecting said agitator assembly means to a source of water.

4,157,078

VERTICAL BOILER

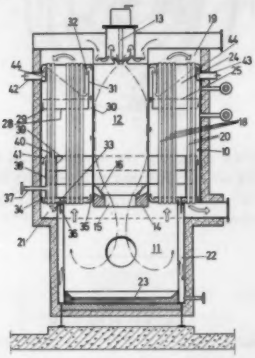
Nils Östbo, Volrat Thamsgatan 4, Göteborg, Sweden (41278)

Continuation-in-part of Ser. No. 845,972, Oct. 27, 1977. This application Mar. 8, 1978, Ser. No. 884,564

Claims priority, application Sweden, Nov. 11, 1976, 7612551; Nov. 11, 1976, 7612552

Int. Cl.[2] F22B *7/12*

U.S. Cl. 122—182 S **4 Claims**



1. In a vertical boiler comprising a convection part and a final combustion chamber aligned therewith;

a drum defined by a cylindrical envelope wall and upper and lower plane end walls, and enclosing a water space,

a flame tube located centrally within said drum, and extending between the end plates thereof, said flame tube having burner means at its end at said upper end plate and communicating with said final combustion chamber at its opposite end,

at least two groups of smoke tubes arranged concentrically, one outside the other, around said flame tube, extending between said end plates, an inward of said at least two groups communicating wth said final combustion chamber,

a turning chamber located outside said upper end plate for communicating said at least two groups of smoke tubes,

a smoke gas outlet communicating with an outward of said at least two groups of smoke tubes,

a water cooled wall defining said final combustion chamber, and communicating with the water space within said drum, intermediate the inward and the following group of said at least two groups of smoke tubes, and

at least one annular box structure enclosing one of said groups of smoke tubes, at the end thereof adjacent to said lower end plate, and being provided with an inlet and an outlet transferring a boiler fluid.

4,157,079

INTERNAL COMBUSTION ENGINE AND OPERATING CYCLE

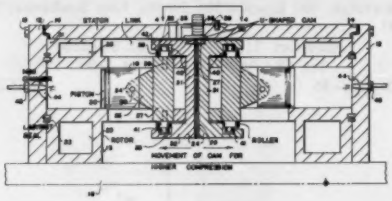
Haakon H. Kristiansen, 484 Bedson St., Winnipeg, Manitoba, Canada

Division of Ser. No. 546,909, Feb. 4, 1975, Pat. No. 4,022,167, which is a continuation-in-part of Ser. No. 433,237, Jan. 14, 1974, abandoned. This application Mar. 11, 1977, Ser. No. 776,918

Int. Cl.[2] F02B *57/00*

U.S. Cl. 123—43 AA **10 Claims**

1. An internal combustion engine which includes means for supplying fuel and air and exhaust means; comprising in combination, a hollow cylindrical stator, closed at each end thereby defining a cylindrical chamber therein, a pair of cylindrical rotors disposed within said stator, means for journalling said rotors on a common axis for rotation within said stator, a cam assembly mounted centrally of said stator, said cam assembly having a lobed profile on each side thereof, said profiles being a mirror image of one another, a cylinder head in said stator at each end thereof, a plurality of cylindrical bores formed in each of said rotors with the axes thereof parallel to the axis of said rotors, and situated annularly around the axis of said rotor, a piston reciprocal in each of said bores, and connecting means operatively connecting said pistons of each rotor to the lobed profile of its corresponding cam side whereby rotation of said rotors rotates the said means connecting said pistons around said cam ring profiles thereby controlling the reciprocal motion of said pistons within said bores, whereby the reciprocal motion of the pistons of one rotor is exactly opposite to the



reciprocal motion of the corresponding pistons of the other rotor, in an opposing, mirror image motion, and a common chamber formed in the same angular location in each of said cylinder heads so as to be brought into alignment with the same successive ones of said bores in said corresponding rotors during the rotation of rotors, said common chamber being of such angular extent as to at least intermittently overlap two adjacent bores during the rotation of said rotors, thereby providing continuous combustion, combustion taking place in opposing bores at the same time, said means for supplying fuel and air and said exhaust means being sequentially and operatively connected to said opposing bores from said respective cylinder heads.

4,157,080

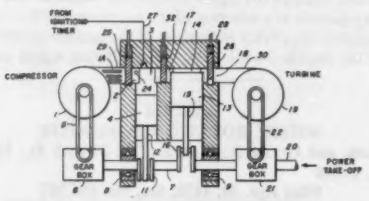
INTERNAL COMBUSTION ENGINE HAVING COMPARTMENTED COMBUSTION CHAMBER

Craig C. Hill, Winter St., Lincoln, Mass. 01773

Continuation-in-part of Ser. No. 601,322, Aug. 1, 1975, abandoned, which is a continuation-in-part of Ser. No. 548,896, Feb. 11, 1975, abandoned. This application May 31, 1977, Ser. No. 802,077

Int. Cl.[2] F02B *25/12*

U.S. Cl. 123—53 B **2 Claims**



1. An internal combustion engine comprising

(1) a compressor for compressing the engine's working medium,

(2) a combustion chamber having first and second cavities in each of which there is a movable member whose motion in the cavity alternately increases and decreases the volume of a variable space in the cavity, the maximum volume of the variable space in the second cavity being larger than the maximum volume of the variable space in the first cavity, and the movable member of the second cavity

being the only element of the pair of movable members to provide net positive work output,

(3) the first cavity having an inlet port for induction of working medium compressed by the compressor,

(4) a transfer duct connecting the first and second cavities and providing the only outlet for working medium from the first cavity and the only inlet for entrance of working medium into the second cavity,

(5) the second cavity having an exhaust port for exhaust of the products of combustion,

(6) means governing the motion of the movable members in the cavities whereby all or a substantial part of every period of decreasing volume of the variable space in the first cavity is concurrent with all or a substantial part of every period of increase in volume of the variable space in the second cavity and working medium is caused to be transferred through the duct from the decreasing first cavity space to the increasing second cavity space in every period of decreasing volume of the variable space in the first cavity,

(7) means for adding fuel to the working medium to enable combustion to occur in the combustion chamber, whereby the pressure of the combusted gases impels the movable member in the second cavity in every period when the volume of the variable space in the second cavity is increasing and opposes the motion of the member in the first cavity in every period when the volume of the variable space in the first cavity is decreasing,

(8) an igniter for igniting the fuel in the combustion chamber, and

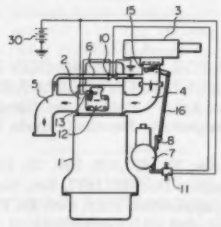
(9) timing means for initiating ignition in the combustion chamber when the volume of the variable space of the first cavity is substantially at its maximum.

4,157,081

RECIRCULATED EXHAUST GAS CONTROL DEVICE FOR USE IN A DIESEL ENGINE

Junichi Wake, Yono, and Hiroshi Matsuda, Sakado, both of Japan, assignors to Nissan Diesel Motor Co., Ltd., Ageo, Japan

Filed Jan. 18, 1978, Ser. No. 870,485
Claims priority, application Japan, Jan. 18, 1977, 52-003569
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **13 Claims**



1. A diesel engine having a intake passage and an exhaust passage, comprising:

a throttle valve disposed in the intake passage which gradually opens, in accordance with an increase in level of the engine load;

a recirculated exhaust gas passage communicating the exhaust passage with the intake passage and having an outlet which opens into the intake passage at a position located downstream of said throttle valve for gradually reducing the exhaust gas recirculation ratio in accordance with an increase in a level of the engine load;

a detecting means for checking the level of the engine load to provide an output signal indicating that the engine is operating under a heavy load, and

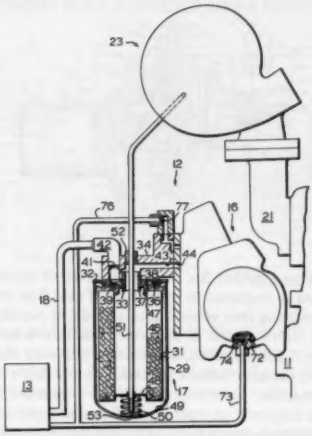
a valve means disposed in said recirculated exhaust gas passage for stopping the recirculating operation of the exhaust gas in response to said output signal when the engine is operating under a heavy load.

4,157,082

SELF-PURGING FUEL SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINES

Ralph R. Day, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 9, 1977, Ser. No. 776,059
Int. Cl.[2] F02M *37/00*
U.S. Cl. 123—136 **11 Claims**



1. A fuel system for an engine which has a fuel combustion chamber, means forming an air passage for admitting air to said combustion chamber, a fuel tank and a pumping device for transferring fuel from said tank to said combustion chamber through a fuel flow path, said fuel system further comprising: a housing defining a liquid fuel chamber which forms a portion of said fuel flow path and which contains a volume of liquid fuel during operation of said engine and in which liquid water from said fuel tends to collect, said fuel chamber having an inlet for receiving liquid fuel and an outlet for transmitting liquid fuel on towards said combustion chamber, said outlet being situated above the bottom region of said fuel chamber, and a water purging conduit means connected to said housing and communicating said bottom region of said fuel chamber with a discharge point in said system which is away from said fuel chamber and which is at least intermittently at a lower pressure than said bottom region of said fuel chamber during periods when said engine is operating thereby creating a pressure difference between the ends of said purging conduit means which forces an outflow of liquid from said bottom region of said fuel chamber through said purging conduit means during said periods when said engine is operating and said discharge point is at said lower pressure.

4,157,083

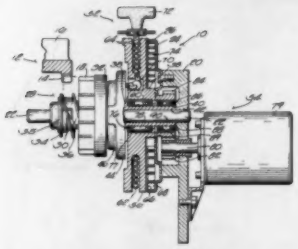
COMBINATION MANUAL AND POWER STARTER FOR ENGINES

LaVerne D. Smith, Wataga, Ill., and William H. Wulff, Cedar Grove, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 6, 1977, Ser. No. 803,765
Int. Cl.[2] F02W *17/00*
U.S. Cl. 123—179 P **15 Claims**

1. A starter mechanism for an engine having a starter gear, said starter mechanism comprising a starter housing fixed relative to the engine, a starter shaft mounted for rotation

relative to said starter housing, a starter pinion, means rotatably mounting said starter pinion on said starter shaft for axial movement, in response to rotation of said starter shaft in one direction, from a retracted position to an engine starting position in driving engagement with the starter gear, a drive member mounted for rotation coaxially with said starter shaft and drivingly connected to said starter shaft, first and second drive means selectively operable for rotating said drive member in said one direction to start the engine, first one-way clutch means on said drive member connecting said first drive means



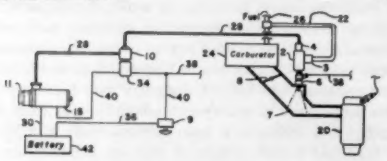
with said drive member for rotating said drive member in said one direction in response to operation of said first drive means and for permitting free wheeling of said drive member relative to said first drive means in said one direction when said first drive means is not operated, and second one-way clutch means on said drive member connecting said second drive means with said drive member for rotating said drive member in said one direction in response to operation of said second drive means and for permitting free wheeling of said drive member relative to said second drive means in said one direction when said second drive means is not operated.

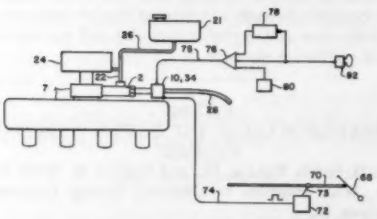
4,157,084

FUEL INJECTION SYSTEM AND METHOD FOR INTERNAL COMBUSTION ENGINE

Marvin E. Wallis, 5535 Longfellow Rd., Santa Barbara, Calif. 93111

Filed Sep. 20, 1977, Ser. No. 834,875
Int. Cl.[2] F02N *17/00*; F02B *3/00*
U.S. Cl. 123—179 L **30 Claims**





25. Apparatus for starting an internal combustion engine by supplying a volatile air-fuel mixture to the engine during engine start-up comprising, in combination:

air-fuel mixing means connected to supply, prior to starting the engine, an air-fuel mixture to the engine and including a mixing chamber, a source of air under pressure, and means for directing a flow of pressurized air from said air source through said mixing chamber;

means for supplying fuel into said flow of pressurized air whereupon said fuel is mixed with said air in said mixing chamber; and

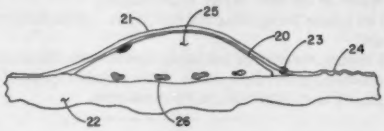
control means for operating said air-fuel mixing means during engine start-up including a source of electrical power and means for selectively coupling said electrical power source and said air source one to the other to actuate said air source, prior to starting the engine, to supply air to said directing means, whereby a mixture of air and highly combustible, atomized fuel is supplied to the engine to start the engine, and means for disabling said control means after engine startup.

4,157,085

SURGICALLY IMPLANTABLE TISSUE EXPANDING DEVICE AND THE METHOD OF ITS USE

Eric D. Austad, Ann Arbor, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Mar. 24, 1978, Ser. No. 889,787
Int. Cl.[2] A61B *19/00*; A61F *1/00*
U.S. Cl. 128—1 R **15 Claims**



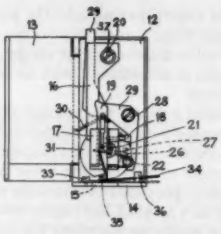
1. A surgically implantable device for expanding skin tissue and mucous membrane, the device comprising a partially collapsed sealed flexible envelope formed substantially from a membrane which is permeable to extracellular body fluid and a material contained within the envelope which is selected to provide sufficient osmotic pressure across the membrane to draw extracellular fluid thereacross, causing the envelope to expand and resulting in corresponding expansion of tissue under which the device is implanted.

4,157,086

APPARATUS FOR PROVIDING SKIN CUTS TO A PREDETERMINED MEASURE

Michele Maiorano; Luigi Valentini, and Claudio Praga, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Continuation of Ser. No. 657,935, Feb. 13, 1976, abandoned. This application Dec. 29, 1977, Ser. No. 865,398
Claims priority, application Italy, Oct. 13, 1975, 28218 A/75
Int. Cl.[2] A61B *17/32*
U.S. Cl. 128—637 **4 Claims**



1. An apparatus for providing cutaneous or skin cuts to a predetermined measure, comprising:

a casing having a bottom plate and slit formed in said bottom plate;

a manually operable member exterior to the casing and coupled thereto,

a first spring coupling said manually operable member to said casing;

a movable rigid assembly coupled to said casing, said assembly comprising an arm having an elongated slot at a distal end thereof relative to said bottom plate and an elongated groove intermediate between said slot and the other end of said arm, a bladeholder mounted on said arm, a blade with a cutting end coupled to said bladeholder, and a second spring for biasing said assembly such that said assembly is movable between two end of stroke positions at which said cutting end of said blade is farthest away from said bottom plate under and respectively against the action of said second spring;

means for coupling said assembly to said casing, said coupling means comprising a first pin integral with said casing inserted into and movable within said elongated slot of said arm of said rigid assembly, a rotatable member extending through said casing and coupled to said manually operable member, said rotatable member having a second pin integral therewith and inserted into and movable within said elongated groove of said arm such that said assembly and said shaft are loaded by said first spring, the assembly arm being urged towards said slit by said second spring and restrained at an intermediate location along its length by means of said second pin, said manually operable member provided for moving the assembly to that end of stroke position at which said first spring is loaded;

a manually releasable member for retaining the assembly at that end of stroke position at which said first spring is loaded;

whereby upon release of said manually releasable member rotational movement is transmitted to said rotatable member by said first spring, said rotatable member then acting on said arm by means of said second pin in said groove such that said cutting end of said blade defines a generally curvilinear trajectory through the casing at one side of said slit, followed by a relatively rectilinear movement to the other side of said slit, and then a curvilinear return trajectory to the interior of the casing, the end of said slot farther from said bottom plate contacting said first pin integral with the casing after the blade cutting end protrudes from said slit while allowing free movement of the second pin integral with the rotating member in said groove, the radial distance between said first pin contacting said end of said slot farther from said bottom plate and the cutting end of said blade defining a radius of curvature of said relatively rectilinear movement of said blade cutting end.

4,157,087

PERIPHERAL NERVE STIMULATOR

Curtis H. Miller, Burnsville, and Mark R. Kaldun, St. Paul, both of Minn., assignors to Med General, Inc., Minneapolis, Minn.

Filed Mar. 6, 1978, Ser. No. 883,530
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—741 **3 Claims**

1. A peripheral nerve stimulator for selectively applying different patterns of stimulating pulses to the body of a patient for monitoring the neurological reactions of a patient following the administration of muscle relaxant drugs thereto, comprising:

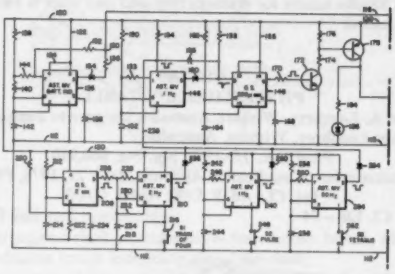
(a) a source of direct current potential;

(b) a first monostable multivibrator having a trigger input terminal and an output terminal, said first monostable multivibrator being connected to said source of direct current potential for producing an output pulse of a predetermined duration each time said monostable multivibrator receives a trigger pulse at said trigger input terminal;

(c) at least three astable multivibrators adapted to be individually connected through manually operable switching means to said source of direct current potential, a first and a second of such astable multivibrators producing output signals of predetermined differing frequencies when so connected to said source of direct current potential;

(d) a second monostable multivibrator having a trigger input terminal and an output terminal, said second monostable multivibrator being connected to said source of direct current potential for producing an output pulse of a predetermined duration when said manually operated switching means is operated;

(e) means coupling the output of said second monostable multivibrator to the third of said astable multivibrators for



enabling said third astable multivibrator only during the unstable period of said second monostable multivibrator;

(f) means coupling the outputs of each of said three astable multivibrators to said trigger input terminal of said first monostable multivibrator;

(g) output means responsive to signals developed at said output terminal of said first monostable multivibrator for generating constant current stimulating pulses of a desired frequency, rate and amplitude; and

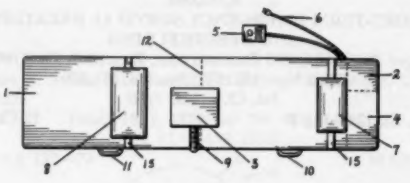
(h) electrode means for applying said stimulating pulses to a site proximate a predetermined peripheral nerve on the patient such that the reaction of the patient to said stimulating pulses can be visually observed.

4,157,088

AUDIO RELAXER-MASSAGER

Viola N. Gracey, 2700 - 33rd St., Snyder, Tex. 79549

Filed Mar. 14, 1977, Ser. No. 777,106
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—33 **1 Claim**



1. A portable massaging - relaxation device, comprising:

(a) a pad for receiving the body of the user, and having a length designed to accomodate the average human body;

(b) means attached to said pad for inducing vibrations therein;

(c) a compact cassette tape player disposed within said pad and adjacent the portion thereof designed to receive the head of the user, said cassette player containing a prerecorded tape with specific relaxation instructions;

(d) first pillow means for supporting only the neck of the user;

(e) second pillow means for supporting only the bend under the knees of the user;

(f) detachable infrared heat lamp and blower means attached to said pad and normally extending thereabove and means for mounting said heat lamp and blower means for permitting said means to be swivelled to a position parallel to said pad for storage purposes and including a flexible neck for permitting adjustment of the position of said heat lamp and blower means;

(g) control means disposed adjacent said pad for regulating said vibration means, said message means and said heat lamp and blower means;

(h) means disposed within said pad to provide thermostatically controlled heat;

(i) means permitting said pad to be folded for storage; and

(j) handle means for transporting said pad after it has been folded.

4,157,089

PHYSIOTHERAPY TABLE

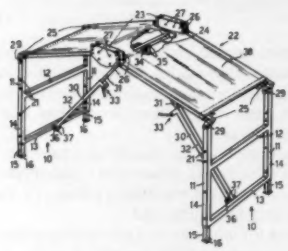
Kevin A. Loughrey, Wishart, Australia, assignor to Janice Margaret Loughrey, Wishart, Australia

Filed Dec. 15, 1977, Ser. No. 860,970

Claims priority, application Australia, Dec. 21, 1976, PC8561

Int. Cl.[2] A61F *5/00*; A61G *13/00*

U.S. Cl. 128—74 **3 Claims**



1. A physiotherapy table including a table top comprising two top sections disposed end to end, adjustable hinge means connecting the two top sections for pivotal movement about a transverse axis, vertically adjustable supporting means pivotally connected to each of said top sections, and longitudinally extensible stays pivotally interconnected to and extending between said supporting means and said hinge means.

4,157,090

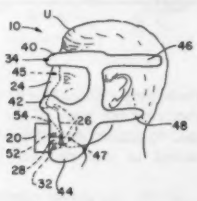
SHORT-TERM EMERGENCY SURVIVAL BREATHING AND EYE-SHIELDING

Jacque R. Phillips, 835 Fountain Ave., Lancaster, Pa. 17601

Filed Nov. 15, 1977, Ser. No. 851,679

Int. Cl.[2] A62B *7/00*

U.S. Cl. 128—141 R **15 Claims**



1. In a facemask including means for supplying breathing mixture and for shielding a user's face in emergency, the improvement comprising: means for unfolding and deploying the facemask across a user's face in response to slapping the facemask against the user's face, including means for securing the facemask on the user's head in response to said deployment of the facemask across a user's face.

4,157,091

RESPIRATOR

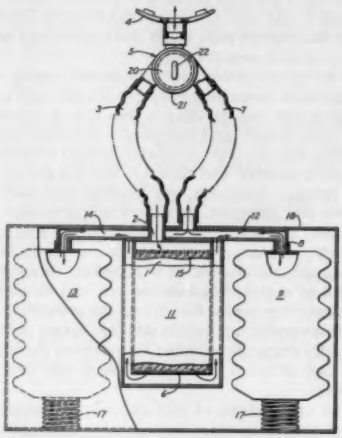
Klaus Pampuch, Berlin, Fed. Rep. of Germany, assignor to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,202

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1976, 2641576

Int. Cl.[2] A62B *7/00*

U.S. Cl. 128—142 R **2 Claims**



1. A respirator comprising a mouthpiece, a casing provided in its top with an inlet opening and an outlet opening, an inhalation tube connecting said outlet opening with the mouthpiece, an exhalation tube connecting the mouthpiece with said inlet opening, a canister in said casing provided at one end with an inlet connected with said casing inlet opening, the canister having an outlet at its opposite end, a chemical in the canister between its inlet and outlet that removes water vapor and carbon dioxide from air flowing through it and liberates oxygen into that air, a housing containing the canister and spaced from its outlet end, the housing having a pair of outlets communicating with the canister outlet, a pair of expandable chambers in said casing with said housing between them, each chamber being provided with a single inlet-outlet port, conduits connecting said housing outlets with said ports and said casing outlet opening, and means in the casing resisting expansion of said chambers during exhalation through said canister, whereby to maintain the air in the respirator under positive pressure.

4,157,092

DIRECT-ACTING RESPIRATOR

Angelo Fare, and Giovanni Fumagalli, both of Milan, Italy, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 4, 1976, Ser. No. 729,574

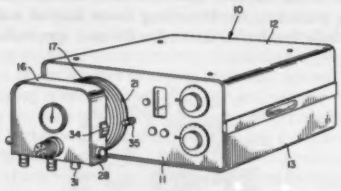
Claims priority, application Switzerland, Oct. 24, 1975, 13793/75

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—145.6 **5 Claims**

1. In a respirator for assisted and controlled respiration, having a fixed structure incorporating a pump unit with means defining a variable-volume chamber which has a fixed wall part supported in said structure and a movable wall part operatively associated with said fixed wall part, drive means for providing a reciprocating movement and coupling means connecting said movable wall part to said drive means whereby,

said movable wall part is reciprocably movable with respect to said fixed wall part, wherein the improvement comprises a connector unit having rigidly attached thereto said fixed wall part of said means defining said chamber and having means for providing readily releasable connection to said structure, gas feed and delivery lines extending through said connecting unit



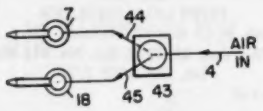
and said fixed wall part and communicating with said variable volume chamber, and said coupling means comprising a direct-contacting, quick disconnecting coupling arrangement operatively associated between said movable wall part and said drive means and engageable solely by a linear movement of one of said movable wall part and said drive means relative to the other.

4,157,093

HYGIENE SYSTEM

Ralph H. Brodsky, 14 E. 81 St., New York, N.Y. 10028

Filed Feb. 9, 1978, Ser. No. 876,381
Int. Cl.² A61M *3/00*
U.S. Cl. 128—225 **7 Claims**



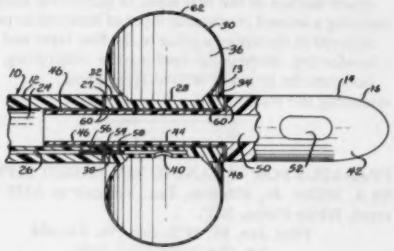
1. A system for oral and vaginal hygiene and for contraceptive use comprising a source of compressed air having a compressed air outlet, an output connector means attached to control flow from the outlet, a first spray device for oral hygiene adapted for connection to the connector means to receive compressed air from the source and a second spray device for vaginal hygiene and contraceptive use adapted for connection to the connector means to receive compressed air from the source, wherein the first spray device, which has a first liquid container with a removable spray head connected thereto and an elongate output probe defining an outlet passage leading to a spray nozzle defined at one end of the probe, is actuated by compressed air received by way of the connector means to eject a spray of liquid from the container through the nozzle and wherein the second spray device, which has a second liquid container with a second removable spray head connected thereto a second elongate output probe defining a liquid outlet passage and a compressed air outlet passage leading to a spray nozzle at one end of the probe and a control valve mounted in the second spray head for movement between first and second operative conditions to control flow of compressed air and liquid respectively through the compressed air and liquid passages of the second probe, is actuated by compressed air received by way of the connector to eject a spray from the nozzle of the second probe, the spray, with the control valve in its first operative condition, consisting solely of a stream of liquid from the second container and, with the control valve in its second operative condition, consisting of a mixture of liquid from the second container and compressed air.

4,157,094

CATHETER WITH IMPROVED BALLOON AND TIP ASSEMBLY

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Sep. 1, 1977, Ser. No. 829,767
Int. Cl.² A61M *25/00*
U.S. Cl. 128—349 B **9 Claims**



1. A catheter, comprising:

an elongated shaft having a distal end, a main lumen, and an inflation lumen extending along the shaft;

a tip member having a tip portion defining a distal end of the catheter and a proximal shoulder, an annular tongue extending proximally from said tip portion shoulder and having a proximal end portion received in the main lumen of the shaft, said proximal tongue portion being bonded to the shaft with the shaft and tip member defining an annular groove recessed from an outer surface of the shaft intermediate the distal end of the shaft and said tip portion shoulder, said tip member having a lumen extending through said tongue, and an opening in said tip portion communicating with said lumen;

a separate annular balloon member positioned in said groove and overlying said tongue, said balloon member having outer and inner walls of elastic material joined at sides of the balloon member and defining a cavity, with a proximal side of said balloon member being located adjacent the distal end of said shaft, and with a distal side of said balloon member being located adjacent the tip portion shoulder; and

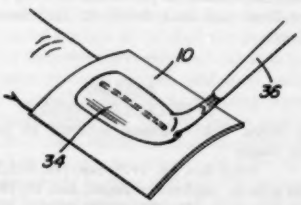
means for establishing communication between the inflation lumen and said cavity to inflate said outer wall.

4,157,095

REINFORCED ARTIFICIAL FINGERNAIL

Sandra S. Sweet, P.O. Box 2744, Rolling Hill Estates, Calif. 90274

Filed Feb. 1, 1978, Ser. No. 874,314
Int. Cl.² A45B *29/00*
U.S. Cl. 132—73 **14 Claims**



1. A method for forming a reinforced artificial nail on a natural digital nail, comprising the steps of:

disposing a mask on the digit on which the natural digital

nail is carried to expose upper surface portions of the natural digital nail through an opening in the mask;

applying a first continuous layer of hardenable polymeric material to the exposed upper surface portions of the natural digital nail, and to at least portions of adjacent upper surface portions of the mask to extend the apparent length of the artificial nail beyond the length of the natural digital nail;

disposing a reinforcing element on at least portions of the upper surface of the first layer of polymeric material;

applying a second continuous layer of hardenable polymeric material to the upper surface of the first layer and over the reinforcing element to enclose the reinforcing element between the first and second layers; and,

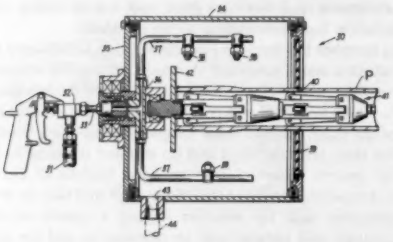
removing the mask.

4,157,096

APPARATUS FOR CLEANING THREADED PIPE ENDS

John A. Miller, Jr., Houston, Tex., assignor to AMF Incorporated, White Plains, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,684
Int. Cl.[2] B08B *3/02, 9/02*
U.S. Cl. 134—111 **10 Claims**



1. Apparatus forming a closed fluid system for cleaning the ends of pipes, comprising

a wash head for cleaning the pin end of a pipe defining a sealed wash chamber when a pipe end is disposed therein, and having a manually operable valve for controlling the flow of cleaning fluid to said wash chamber;

a wash head for cleaning the box end of a pipe defining a sealed wash chamber when a pipe end is disposed therein, and having a manually operable valve for controlling the flow of cleaning fluid to said wash chamber;

each of said wash heads having means for spraying the flow of cleaning fluid against the pipe end disposed therein and seal means for preventing the cleaning fluid from flowing from the pipe end being cleaned into the pipe toward its other end;

tank means for the cleaning fluid;

filter means for removing contaminants from the cleaning fluid after use in said wash heads;

first pump means causing the used cleaning fluid to flow from said wash head through said filter means to said tank means; and

second pump means for providing cleaning fluid under pressure from said tank means to said manually operable valves.

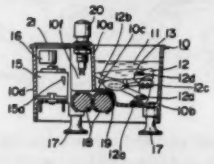
4,157,097

SPECTACLE WASHER

Masami Miya, Tokyo, Japan, assignor to Seizo Takahashi, Tokyo, Japan

Filed Jun. 14, 1978, Ser. No. 915,356
Claims priority, application Japan, Jun. 16, 1977, 52-77843[U]
Int. Cl.[2] B08B *3/04*
U.S. Cl. 134—117 **5 Claims**

1. A spectacle washer comprising: a washing tub of a generally rectangular shape for reserving a washing liquid therein, said washing tub having one of its longer side walls bulging thereinto to form a nose-shaped bulge extending along the vertical center line of said one of its longer side walls, said washing tub having its bottom wall partially raised to form a raised bottom extending around said vertical center line and merging into said nose-shaped bulge, said raised bottom being shaped and sized to allow at least one pair of the lower portions of the paired rims and the paired nose pads of a pair of spectacles to stably rest thereon, while one of the sides of said spectacles being placed on the remaining lower bottom wall, when said spectacle washer is located with said spectacles; and a



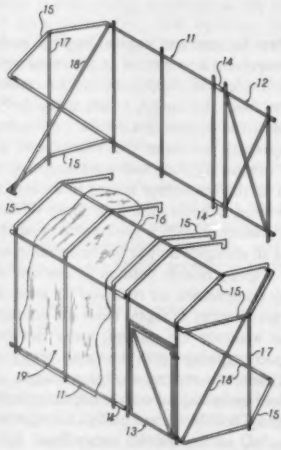
mechanical vibrator including an electric motor mounted on said spectacle washer such that its vertical shaft of rotation is positioned in the vertical center plane, in which said vertical center line extends, and an eccentric weight having its eccentric shaft of rotation connected to the vertical shaft of said electric motor for horizontally vibrating said spectacle washer as a whole and accordingly said spectacles relative to said washing liquid, when it is turned by said electric motor, so that said spectacles may be washed with said washing liquid by the actions of the shearing forces established inbetween.

4,157,098

PORTABLE SHELTER

Byron W. Cronk, P. O. Box 82, Huntley, Mont. 59037

Filed Jan. 23, 1978, Ser. No. 871,358
Int. Cl.[2] A45F *1/16*
U.S. Cl. 135—3 R **10 Claims**



1. A portable shelter including a plurality of sidewall framing sections, a plurality of connectors joining adjacent sidewall sections to form vertical sidewalls, a plurality of arched crossmembers extending from the top portions and the end portions of said vertical sidewalls, crossbrace members extend-between adjacent end portions of said sidewalls, and a covering of a flexible sheet material disposed over the assembled sidewall sections and arched crossmembers; said sidewall framing sections being formed of four straight lengths of tubing affixed

perpendicular to each other with the ends of each length of tubing extending a significant distance beyond the crossing point thereof with lengths of tubing perpendicular thereto, certain of said sidewall framing sections being of a square configuration of equal height and width and having a length of tubing disposed intermediate and parallel to the lengths of tubing forming opposite sides of the sidewall sections, and other of said sidewall sections being of a rectangular configuration with a height equal to the sidewall sections of square configuration and a width approximately one-half the height and having diagonal brace members connecting opposite crossing points of the lengths of tubing, and said sidewall framing sections being reversible and invertable and capable of accommodating the ends of said arched crossmembers in any orientation; said arched crossmembers each having a transverse central opening to receive a common roof or end brace member; said arched crossmembers and said connectors having an inside tubing diameter slightly larger than the outside diameter of the tubing of said sidewall sections so that the ends of said arched crossmembers and said connectors can be slidably disposed over the tubing ends extending from said sidewall sections in the erection of said shelter; and matching transverse openings in the tubing of said sidewall sections, said arched crossmembers, said connectors and said crossbrace members for insertion of connecting pins to secure the respective components to each other.

4,157,099

LOW NOISE FAUCET

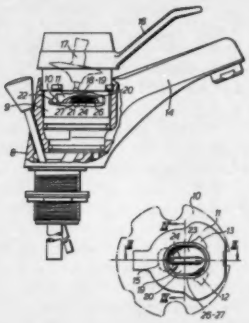
Wilfried Delker, Bonn-Beuel, and Richard Burg, Neumagen-Dhron, both of Fed. Rep. of Germany, assignors to American Standard Inc., New York, N.Y.

Filed May 16, 1977, Ser. No. 797,539

Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622179

Int. Cl.[2] F16K *11/00, 47/02*

U.S. Cl. 137—625.17 **10 Claims**



1. In a water faucet having a valve body with control elements formed by two discs, the first disc being stationary and having water inlet openings and a water outlet opening connected on one side to a valve manifold and on the other side directed toward the second disc which is movably arranged on the first disc, the second disc having a surface cavity arranged and constructed to overlap the inlet openings and the outlet opening formed in the first disc, the improvement comprising:

a noise reducing assembly disposed within the surface cavity of the second disc and including at least one integrally formed screen basket and at least one protrusion being in the form of a raised section of screen which extends towards the first disc into the flow passageway between the inlet and outlet openings while maintaining a free water flow passageway between said raised section, said screen and said stationary disc to thereby reduce the noise level during operation of the water faucet.

4,157,100

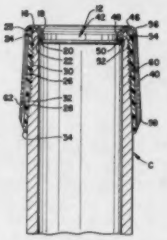
THREAD PROTECTOR DEVICE

John Turk, 11433 Lansing Dr., Garfield Heights, Ohio 44125

Filed Aug. 17, 1977, Ser. No. 825,301

Int. Cl.[2] B65D *59/06*

U.S. Cl. 138—96 T **13 Claims**



1. A thread protector for protecting a generally cylindrical hollow member externally threaded from one end over a portion thereof and wherein said member has inner and outer diameters, said thread protector comprising:

an inner sleeve constructed from a resilient material to have a continuous sleeve side wall and open inner and outer ends with the inner surface of said sleeve side wall having a threaded area extending from at least adjacent said sleeve outer end toward said sleeve inner end adapted to threadedly receive at least a portion of the externally threaded area of said member, said sleeve including an annular flange adjacent said sleeve inner end extending generally radially inward from said sleeve side wall and merging into an annular lip which extends from the area of merger to a terminal edge disposed generally further radially inward and toward said sleeve outer end, said sleeve flange and lip being dimensioned so that at least some portion of said sleeve lip between the area of merger with said sleeve flange and lip terminal edge is adapted to engage said member one end as said member is threadedly received in said sleeve and said sleeve lip is adapted to cammingly engage the inside surface of said member one end as said member is further threadedly received in said sleeve to a position where at least said lip engages said inside surface of said member for compressingly engaging and sealing said member one end;

an outer shell received over said sleeve constructed from a material having a greater rigidity than said resilient material to have a continuous shell side wall and open inner and outer ends, said shell being dimensioned so that at least a substantial portion of the shell side wall inner surface is spaced from the sleeve side wall outer surface over the coextensive portions thereof, said shell including a shell flange disposed in an abutting covering relationship with said sleeve flange and merging into a shell lip disposed in an abutting covering relationship with said sleeve lip, said shell lip is adapted to bolster said sleeve lip as said sleeve lip cammingly engages said member one end;

means disposed between the sleeve and shell side walls for maintaining the spaced apart relationship therebetween and for cushioning said sleeve against the effects of blows imparted to said shell; and,

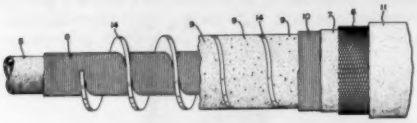
means for fixedly retaining said shell on said sleeve.

4,157,101

HOSE STRUCTURE

John A. Ross, Tandragee, Northern Ireland, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 854,572, Nov. 25, 1977, abandoned, which is a continuation of Ser. No. 691,731, Jun. 1, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 867,215
Int. Cl.[2] F16L *11/00*
U.S. Cl. 138—130 **17 Claims**



1. A large diameter suction and discharge hose comprised of elastomeric material incorporating reinforcing elements comprising an innertube of elastomeric material, at least two radially spaced windings of monofilament lying outwardly of said innertube and wound at an angle of 50°–60° to the axis of the hose with said windings being of opposite hand orientation, a layer of elastomeric material having a thickness of at least 5% of the hose diameter between the windings of monofilament, a cover layer of elastomeric material around the outer surface of the hose, at least one layer of aramid fabric positioned in the wall of the hose between the innertube and cover layer adjacent to at least one of the windings of monofilament, and an elastomeric adhesive layer between the monofilament and aramid fabric to effect a bond between the two upon vulcanization of the integral structure.

11. A large diameter suction and discharge buoyant hose comprised of elastomeric material incorporating reinforcing elements comprising an innertube of elastomeric material, at least two radially spaced windings of monofilament lying outwardly of said innertube and wound at an angle of 50°–60° to the axis of the hose with said windings being of opposite hand orientation, a layer of cellular polymeric foam material between the windings of monofilament and taken from the group comprising natural rubber, styrene butadiene rubber, polychloroprene rubber, cross-linked polyethylene, cross-linked ethylene vinylacetate copolymer, polyurethane or plasticized polyvinyl chloride, the density being in the range of 0.01 to 0.75 grms/ml and a thickness of at least 5% of the hose diameter, and a cover layer of elastomeric material around the outer surface of the hose, the completed hose being vulcanized into an integral structure.

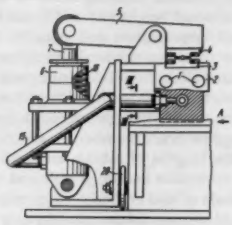
4,157,102

DEVICE FOR MOVING DIES IN A MACHINE FOR THE MANUFACTURE OF TWISTED WIRE ARTICLES WITH ALTERNATING DIRECTION OF TWIST

Gennady D. Pershin; Valentin P. Emelyanov, and Gennady K. Schegolev, all of Magnitogorsk Chelyabinskol oblasti, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Metiznoi Promyshlennosti (Vniimetiz), Magnitorsk, U.S.S.R.

Filed Jan. 13, 1978, Ser. No. 869,126
Int. Cl.[2] B21F *7/00*
U.S. Cl. 140—149 **5 Claims**

1. Device for moving dies to grip and release wire articles in a machine for the manufacture of twisted wire articles with alternating direction of twisting, said device comprising guides fastened to a bed of said machine along the axis of pulling; a slider having a through passage and mounted for reciprocal movement on said guides, said through passage being adapted to be connected to a source of fluid under pressure; means for moving the slider; a lower die fixed to said slider; an actuating cylinder articulated to said slider; a double-arm lever articulated to a piston rod of said actuating cylinder and to said slider and having a free end; an upper die secured to the free end of said lever; a control valve disposed in the slider through passage of said slider for controlling communication between the fluid source and the piston chamber of said actuating cylinder;



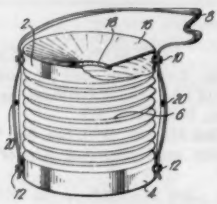
and means for moving said control valve to control communication between the piston chamber and the fluid source.

4,157,103

CONTAINER

George H. La Fleur, P.O. Box 8, Clarkson, Ontario, Canada

Filed Nov. 28, 1977, Ser. No. 855,363
Int. Cl.[2] B65B *3/04, 39/00*
U.S. Cl. 141—98 **8 Claims**



1. A container molded from plastics material in extended full-capacity configuration and adapted to be collapsed accordian-fashion for storage,

the container having a bottom portion and a top portion and an intermediate pleated portion,

and diametrically opposite buttons provided on side surfaces of said top portion,

a flexible handle member secured to said bottom portion by securing means at at least one point of securement and providing a handle loop, said handle loop having portions extending upwardly from said bottom portion along opposite sides of the container adjacent the said diametrically opposite buttons,

a first aperture provided in each said handle loop portions an equal distance from said at least one point of securement to receive said buttons provided on said top portion in container-carrying configuration, and

a second aperture in each loop arm between said at least one point of securement and said first aperture to receive said buttons provided on said top portion when the container is collapsed accordian-fashion in storage configuration;

and wherein the container includes a flexible top surface having an opening therein to facilitate filling of, and pouring from, the container.

4,157,104

GASOLINE DISPENSING AND VAPOR RECOVERY APPARATUS

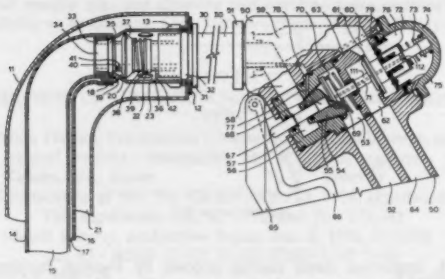
Alden A. Lofquist, Jr., 10 Rita Way, Orinda, Calif. 94563

Filed Oct. 28, 1977, Ser. No. 846,444
Int. Cl.[2] B65B *3/18*
U.S. Cl. 141—292 **5 Claims**

1. Apparatus for dispensing volatile liquids into a container having a filling port and for simultaneously recovering vapor thereby generated, the apparatus comprising:

a nozzle having separate liquid dispensing and vapor recovery passageways,

a handle for supporting the nozzle and for connecting it to external liquid pumping and vapor recovery means, the handle further including separate liquid and vapor, hand-operated shut-off valves for the nozzle liquid dispensing and vapor recovery passageways, and pneumatically operated valve actuator means for simultaneously shutting off both valves, the valve actuator means including a venturi passageway extending through the nozzle which



passageway is normally open at one end, the valve actuator means being triggered by blockage of the open end of the venturi passageway,

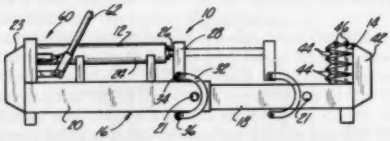
a hollow adaptor for receiving the nozzle and including means for attaching the adaptor in the filling port of the container, the adaptor having separate liquid dispensing, vapor recovery and venturi passageways and connector means for forming removable, fluid tight, separate interconnections between these passageways of the adaptor and those of the nozzle upon insertion of the nozzle into the adaptor.

4,157,105

PORTABLE LOG SPLITTER

Byron J. Gansley, Plymouth, Mich., assignor to Harold Phelps, Plymouth, Mich.

Filed Jul. 29, 1977, Ser. No. 820,398
Int. Cl.² B27L 7/00
U.S. Cl. 144—193 A **8 Claims**



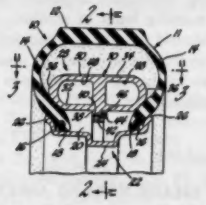
1. A portable log splitter comprising; a base assembly, a blade fixed on said base for penetrating one end of a log, a hydraulic actuator fixedly mounted on said base and having a rod extendable toward said blade, and a pump operable to deliver hydraulic fluid to said actuator to extend said rod into engagement with a log and force it into engagement with said blade, said base being extendable from a storage position in which said hydraulic actuator is in its collapsed position and the end of said rod is adjacent to said blade to an operative position in which said hydraulic actuator and blade are spaced apart to receive a log therebetween.

4,157,106

RUN-FLAT TIRE HAVING INTERNAL SUPPORT MEANS

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1977, Ser. No. 851,843
Int. Cl.² B60C 17/00, 17/04
U.S. Cl. 152—158 **3 Claims**



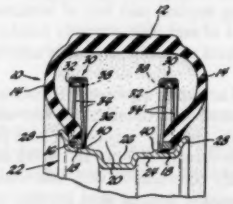
1. For use within a pneumatic tire including a carcass having an outer tread surface, oppositely disposed sidewalls, a bead adjacent each inner sidewall end, and an annular opening between the beaded ends, on a vehicle wheel having an annular rim and annular rim flanges formed on oppositely disposed sides thereof for retaining said beaded ends of said tire in sealing engagement therewith when said tire is inflated; a tire stabilizer comprising a plurality of arcuate segments, each segment including inner and outer support walls, toroidal-shaped sidewalls interconnecting said inner and outer support walls, means on said toroidal-shaped sidewalls for seating on the oppositely disposed inner surfaces of said tire sidewalls a predetermined distance radially outwardly of said beaded ends, and a radially extending assembly flange formed on the inner surface of said inner support wall; a unitizing ring spaced radially from supportive engagement with said rim and abutted against one side of each of said assembly flanges; and fastener means for securing said unitizing ring to each of said assembly flanges so that said ring is entirely supported by said stabilizer and for retaining said means in place against said oppositely disposed inner surfaces of said tire sidewalls with respect to said rim flanges and the portions of said tire walls confined between said rim flanges and said means when said tire becomes deflated.

4,157,107

RUN-FLAT TIRE HAVING INTEGRAL INTERNAL SUPPORT MEANS

Roy S. Cataldo, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1978, Ser. No. 893,471
Int. Cl.² B60C 17/04
U.S. Cl. 152—330 RF **3 Claims**



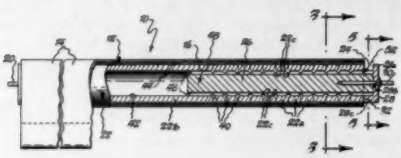
1. In combination with a pneumatic tire including an outer tread portion, oppositely disposed sidewalls, an annular bead adjacent each inner sidewall end, and an annular opening between the beaded ends, and a vehicle wheel having a rim with flanges formed on oppositely disposed sides thereof for retaining the beaded ends in sealing engagement therewith when the tire is inflated; a tire stabilizer comprising a rigid

running band disposed within the tire intermediate the oppositely disposed sidewalls with the circumferential center thereof substantially coplanar with the center of one of the annular beads, two adjacent rows of circumferentially oriented, spaced tension spokes operatively connected at the inner ends thereof to one of the beaded ends and secured at the outer ends thereof to the running band with alternate spokes in each row being oppositely angularly disposed, said spokes retaining the running band in position to support the outer tread portion should the tire become deflated, and an annular ridge formed on the rim adjacent the inner edge of each of the beaded ends to retain the beaded ends in position during a deflated tire condition.

4,157,108
SHADE ROLLER ASSEMBLY

John D. Donofrio, Ogdensburg, N.Y., assignor to Joanna Western Mills Company, Chicago, Ill.

Filed Sep. 16, 1976, Ser. No. 723,781
Int. Cl.[2] A47G *5/02*
U.S. Cl. 160—263 **8 Claims**



1. In a shade roller assembly of the type having a roller formed with an assembly mounting end portion and an opposite hollow, tubular end portion having an end opening, a shade rolled upon said roller, and an assembly mounting plug removably insertable into said tubular end portion through said opening and including means for limiting the amount of insertion of said plug; the improvement for facilitating adjustment of the length of said assembly, which comprises in combination:

said tubular end portion having at least one line of weakness extending circumferentially thereof to define at least one ring element, said ring element being connected to an adjacent portion of said tubular end portion by at least one tear element, said tear element being severable to permit removal of said ring element from said tubular end portion to effect shortening of said assembly by an amount corresponding to the axial dimension of said ring element so removed, said line of weakness being arranged for concealment by said shade when wound on said roller;

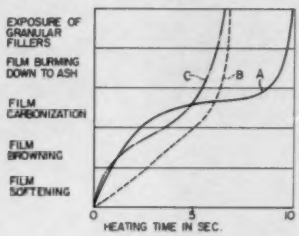
said plug being axially dimensioned to extend inwardly of said opening beyond said line of weakness, whereby an inserted end of said plug normally resides in radial alignment with said adjacent portion of said tubular end portion; and

said plug also including a generally cylindrical body portion and a cap fixed to an outer end of said body portion by a gudgeon pin, said cap including a base portion centrally apertured to receive said pin and being sized to be essentially radially co-extensive with said tubular end portion and an integrally formed skirt portion extending axially from adjacent a rim of said base portion, said skirt portion being internally dimensioned to slidably receive said outer end of said body portion and being discontinuous circumferentially of said rim of said base portion, whereby to cooperate with said base portion and said outer end of said body portion to define a "pull" recess sized to receive a finger of a user of said shade roller assembly to facilitate selective user withdrawal of said plug from within said tubular end portion.

4,157,109
METHOD FOR MANUFACTURING A MOLD FOR METAL CASTING

Atsushi Toyoda, and Hiroshi Kasai, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Sep. 15, 1976, Ser. No. 723,558
Claims priority, application Japan, Sep. 18, 1975, 50-112958; Feb. 6, 1976, 51-11902
Int. Cl.[2] B22D *27/16*; B29C *1/02*
U.S. Cl. 164—7 **12 Claims**

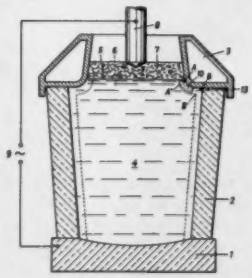


1. Improved metal casting process by vacuum molding comprising the steps of: heating a cover film including, at least partly, an ionomer resin for softening, setting said cover film in the softened state upon the surface of a given pattern via application of pneumatic suction to the latter, placing a hollow frame in position on said cover film set onto said surface of said original pattern by the applied suction, forming a layer of heat resisting granular fillers within said frame on said cover film applying pneumatic suction to said layer of said granular fillers, removing said original pattern after complete solidification of said granular fillers, to provide a mold having a cavity therein, and casting molten metal in said cavity, whereby the cover film first melts before being contacted by the molten metal and permeates the granular filler layer due to the pneumatic suction and is then quickly carbonized to provide the mold with adequate permeability.

4,157,110
METHOD OF PRODUCING INGOTS OF UNALLOYED AND ALLOYED STEELS

Erwin Plockinger; Gert Kühnelt, both of Kapfenberg, and Peter Machner, Leoben, all of Austria, assignors to Vereinigte Edelstahlwerke Aktiengesellschaft (VEW), Vienna, Austria

Filed Dec. 1, 1977, Ser. No. 856,272
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1976, 2655602
Int. Cl.[2] B22D *27/02*
U.S. Cl. 164—52 **6 Claims**



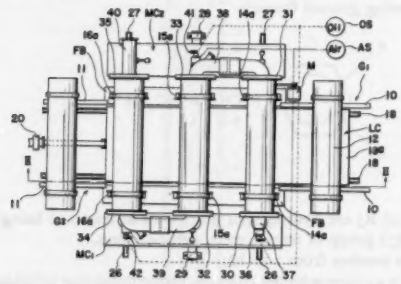
1. In a method of producing ingots of unalloyed and alloyed steels having an improved primary crystallization, reduced ingot segregation and a reduced content of non-metallic inclusions, in which molten steel is poured into a mould having a top

opening, a slag mixture is supplied onto said molten steel in the mould, said molten steel having an upper rim zone bordering said slag mixture, and energy is supplied to said slag mixture while the steel is solidifying in the mould, the improvement comprising the steps of cooling said upper rim zone of said molten steel along an annular area projecting inward of the periphery of the mould top opening by contacting said annular area with a cooled metal top part, allowing said rim zone to shift away from said top part due to ingot shrinkage so as to provide an annular gap between said top part and said cooled upper rim zone, allowing a portion of said slag mixture to enter said annular gap, and allowing said portion of slag mixture to solidify so as to create a seal between the mould and the ingot.

4,157,111
METHOD OF HEAT-TREATING DUCTILE CAST IRON PIPE

Yoshio Tanaka, Takarazuka; Susumu Togawa, Nishinomiya, and Akinori Sakoda, Amagasaki, all of Japan, assignors to Kubota, Ltd., Japan

Continuation of Ser. No. 678,899, Apr. 21, 1976, abandoned. This application Jan. 26, 1978, Ser. No. 872,582
Claims priority, application Japan, Jan. 6, 1976, 51-1298
Int. Cl.[2] B22D *13/02, 33/00;* **C21D** *9/08, 5/00*
U.S. Cl. 164—76 **9 Claims**



1. A method of manufacturing a plurality of ductile cast iron pipes which comprises the steps of:

continuously centrifugally casting molten metal to form, within centrifugal casting molds, castings which ultimately form the ductile cast iron pipes;

transporting the molds with the castings therein, one at a time, while the castings are still in a red-hot state, to an annealing site; annealing the castings within the molds at a plurality of successively different heating zones including at least a first zone and a last zone by passing a hot gas of varying temperature through the castings within the mold such that the first zone has the highest temperature and the last zone the lowest temperature;

successively transferring said molds from the first zone to the last zone in such a manner so as to slow down the dissipation of heat energies from the red-hot castings by the gradual reduction of the temperature in the heating zones, said variation in the temperature of the heating zones being effected by flowing the hot gas first through the hollow portion of the mold containing the casting in the red-hot state at the first zone and then successively into each of the hollow portions of said molds of lower temperature by means of telescopically extensible ducts connecting one mold with another so that the hot gas is gradually cooled as it passes from the mold in the first zone successively to the last zone, automatically clamping said telescopically extensible ducts onto the openings of the molds as the molds move into each heating zone so that all of the molds are connected in a row to form a closed system to permit the gas to pass therethrough; automatically removing said ducts from the molds when being transferred to the next successive zone;

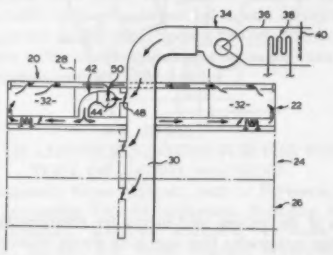
synchronizing said automatic clamping and removal of the telescopically extensible ducts with the movement of the molds from one heating zone to a heating zone of lower temperature so that clamping of the telescopically extensible ducts occurs when the molds are located at the heating zones and removed when the molds are transferred to the next heating zone, and;

removing the castings so heat-treated from the mold in a continuous manner, thereby providing a plurality of ductile cast iron pipes.

4,157,112
AIR CONDITIONING METHOD

Kazimierz Swiderski, Don Mills, Canada, assignor to Canada Square Management Ltd., Toronto, Canada

Filed Feb. 21, 1978, Ser. No. 879,546
Claims priority, application Canada, Mar. 17, 1977, 274221
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—2 **9 Claims**



1. A method of air conditioning a multi-storey building having a core area, and a plurality of occupied spaces disposed around said core area and arranged in zones, the method comprising the steps of:

recirculating air in each said zone of the building from the occupied spaces in said zone to a common fan compartment and back to said spaces through individual ducts, while maintaining the air entering said ducts at a temperature at least substantially as high as the temperature of the air returned to the fan compartment from said spaces;

individually cooling the air in each duct in the event that the temperature of the air in the associated space is above the required temperature;

delivering conditioned fresh air to the core area of the building; and,

delivering make-up air from said conditioned fresh air to the occupied spaces of said individual zones of the building as required.

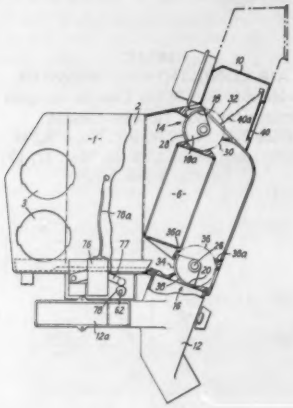
4,157,113
VENTILATION AND TEMPERATURE CONTROL APPARATUS

Frederick J. Karran, Grange Close, Ingrave, Nr. Brentwood, Essex, England, and Arthur R. Nisbet, Coynant, Llanfynydd, Carmarthen, Dyfed, Wales

Filed Apr. 27, 1977, Ser. No. 791,324
Claims priority, application United Kingdom, Apr. 27, 1976, 17059/76
Int. Cl.[2] F28F *27/02;* **B61D** *27/00*
U.S. Cl. 165—42 **12 Claims**

1. A ventilation and temperature control apparatus for an enclosed space or compartment of a vehicle having means for heating and cooling and comprising, in combination, respective airflow conduit means for two different temperature airflows, a plurality of rotary valves for controlling and mixing said airflows, said valves each comprising inlet porting communicating with said airflow conduit means for admitting the different temperature airflows to the valve, respective delivery

conduits for the mixed flows from said plurality of valves and outlet porting of the valves communicating with said conduits, each of said valves comprising a valve body having a peripheral face co-operating with said porting of the valve and means for rotationally adjusting said valves relative to said porting for varying the proportions of the two different temperature airflows admitted by the valve for mixture and also for varying the proportions of the mixed flows directed to said delivery



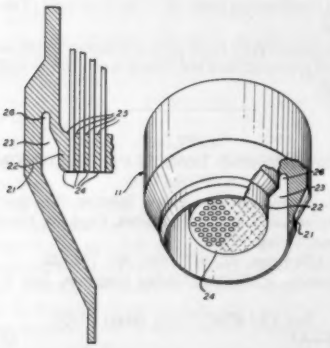
conduits of the valves, said means for rotationally adjusting said valves comprising first operating means connected to said plurality of valves to effect said adjustment of the plurality of valves interdependently, and second operating means connected to at least one of said plurality of valves to effect adjustment of said at least one valve independently of the relative positions of the valves in said interdependent rotational adjustment.

4,157,114

TUBESHEET WITH A THERMAL SLEEVE

John F. De Lorenzo, 90 Mountain Ave., North Caldwell, N.J. 07006

Filed Aug. 22, 1977, Ser. No. 826,314
Int. Cl.[2] F28F *9/02*
U.S. Cl. 165—158 **6 Claims**



1. A tubesheet with a thermal sleeve comprising,
a. a tubular rim,
b. an integral annular concentric support on the inside of the rim and the support defining an annular space,
c. an integral tube plate on the support transverse to the rim,
d. the support forming an integral connection for the tube plate with said tubulation,
e. the tube plate having a ventral face and a dorsal face,
f. the longitudinal depths of the annular space extending beyond the dorsal and the ventral faces of the tube plate,
g. the dorsal and ventral faces of the tube plate being generally opposite the annular space,
h. the annular space between the rim and the support communicating with the dorsal face of the tube plate.

4,157,115

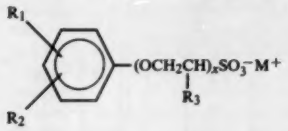
LIGNOSULFONATES AS ADDITIVES IN RECOVERY PROCESSES INVOLVING CHEMICAL RECOVERY PROCESSES

George Kalfoglou, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 591,573, Jun. 30, 1975, abandoned, and Ser. No. 715,957, Aug. 19, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,114
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—274 **4 Claims**

1. A method for recovering oil from a subterranean formation containing oil and having an injection well and a production well comprising

injecting into the injection well an aqueous solution comprising a mixture of lignosulfonate and a surfactant comprising alkyl benzene alkoxylated sulfonates having the following general formula:



(I)

where

R_1 and R_2 are hydrogen or alkyl with at least one being an alkyl group of from 6 to 20 carbon atoms,

x is a number from 1 to 10,

M^+ is a cation selected from the group consisting of lithium, sodium, potassium, ammonium and

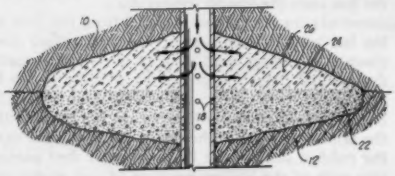
R_3 is either $-CH_3$ or hydrogen.

4,157,116

PROCESS FOR REDUCING FLUID FLOW TO AND FROM A ZONE ADJACENT A HYDROCARBON PRODUCING FORMATION

Gerald R. Coulter, London, England, assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 5, 1978, Ser. No. 912,664
Int. Cl.[2] E21B *33/138, 43/26*
U.S. Cl. 166—280 **23 Claims**



19. A process for vertically isolating a hydrocarbon producing formation from a lower contiguous water zone in a subterranean locus comprising:

introducing into a fracture formed in said locus, wherein said fracture extends into said hydrocarbon producing formation and into said water zone, a quantity of proppant material sufficient to fill at least a major part of the portion of said fracture extending into said water zone;

permitting said proppant material to settle in said portion of

said fracture in said water zone to thereby form a fluid-conductive bed of proppant therein;

introducing into the portion of said fracture extending into said hydrocarbon producing formation a gellable fluid to thereby form a non-conductive plug therein;

introducing into said proppant bed a quantity of sealing material sufficient to fill the pore volume of said proppant bed;

permitting said sealing material to set in said proppant bed to form a non-conductive plug occluding water flow from said water zone to said fracture; and

removing said gellable fluid from said hydrocarbon producing formation.

4,157,117

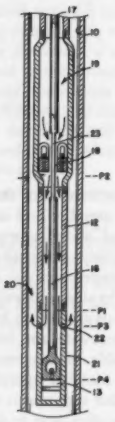
OIL WELL TUBE DRAINING METHOD AND MEANS

Leonard Huckaby, P.O. Box 152, Wayne, Okla. 73095

Filed Sep. 15, 1978, Ser. No. 942,745

Int. Cl.[2] E21B *43/00*; F04B *21/00*

U.S. Cl. 166—311 **6 Claims**



1. A method for draining an oil well tubing including a pipe string and pump barrel at the lower end of the pipe string, to equalize the hydrostatic pressure of oil pumped up through said tubing and the oil in the annulus defined between the exterior of the tubing and the well casing, and wherein a polish rod on the end of sucker rods in the pipe string is provided for reciprocating a pump plunger in said pump barrel between a first lower point and a second upper point, including the steps of:

(a) extending the effective length of the pump barrel;

(b) providing communication between the interior of the effective extended length of the pump barrel and said annulus at a third point below said first point;

(c) treating a section of said polish rod above said second point when said plunger is at said first point to decrease its cross sectional area along said section;

(d) lowering said plunger into the effective extended length of the pump barrel beyond said third point to a fourth point, the treated section of said polish rod being formed on the rod in a position such that it straddles said upper second point extending partly into said pump barrel and partly above said pump barrel when said plunger is at said fourth point so that oil in said tubing can pass into said pump barrel along said section of polish rod and out said communication to said annulus thereby equalizing said hydrostatic pressure.

4. In an oil well tubing including a pipe string and pump barrel at the lower end of the pipe string having a plunger reciprocable between a first lower point in said barrel and a second upper point in said barrel and wherein said plunger incorporates a first travelling check valve and said barrel includes a second fixed check valve at said second point said first and second check valves passing oil only in an upward direction, and further wherein there is provided a polish rod on the end of sucker rods in said pipe string for reciprocating said plunger, means for draining said tubing to equalize the hydrostatic pressure of oil pumped up through said tubing and the oil in the annulus defined between the exterior of said tubing and the well casing, including, in combination:

(a) means defining an effective extension of said pump barrel;

(b) means in said effective extension at a third point below said first point providing communication between the interior of said effective extension and said well annulus; and

(c) means on said polish rod positioned above said second point when said plunger is at said first point, decreasing the cross sectional area of said polish rod along a section of given length sufficient so that when said plunger is lowered by said sucker rods into said effective extension below said third point, said section straddles said fixed check valve to thereby permit oil in said tubing to drain through said section of said polish rod into said barrel and effective extension thereof to pass out said means providing communication to said annulus.

4,157,118

AUTOMATIC CONTROL SYSTEMS FOR THE WORKING TOOL OF A CIVIL MACHINE

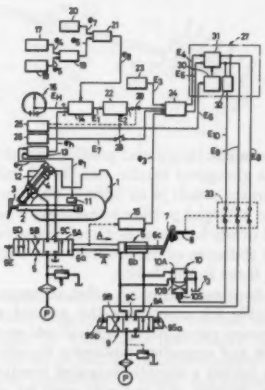
Takashi Suganami; Teruo Manzeki, both of Fujisawa; Tashiro Takeda, Hiratsuka; Tetsuya Nakayama, Fujisawa; Koh Shimizu, Hiratsuka; Keishiro Kurihara, Fujisawa; Tohru Fukumura, Hatano, and Naomi Hatogai, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 29, 1977, Ser. No. 828,444

Claims priority, application Japan, Aug. 31, 1976, 51-104544

Int. Cl.[2] A01B *63/111*

U.S. Cl. 172—4.5 **7 Claims**



1. An automatic control system for a working tool on a civil machine comprising a vehicle having a travelling mechanism and a driving means for driving the travelling mechanism, which comprises:

a. stroke detecting means for detecting an amount of stroke of a lifting cylinder device which expands and contracts to move said working tool up and down;

b. inclination angle detecting means for detecting an inclination angle of said vehicle with respect to the absolute horizontal plane;

c. a first arithmetic means for computing data representative of a height of said working tool with the aid of detection signals produced by said stroke detecting means and inclination angle detecting means; and

d. position setting means for setting a position of said working tool in advance;
e. a first detector means for detecting a throttle opening degree of an engine of said vehicle;
f. a second detector means for detecting a speed of said engine;
g. a second arithmetic means for receiving detection signals from said first and second detector means for detecting a throttle lever opening degree of the engine and said detector means for detecting a speed of said engine to produce a load signal;
h. comparator means which operates to compare said load signal with a set load value and which, when the load signal exceeds the set load value, produces an overload signal; and
i. a third arithmetic means which receives a position setting signal from said position setting means, a working tool present position signal from said first arithmetic means, and an output from said second arithmetic means, and which when no overload signal is applied thereto produces a deviation signal between said position setting signal and said present position signal, and when said overload signal is applied thereto produces a signal instructing to release said position setting signal and present position signal to decrease load on the basis of said overload signal,

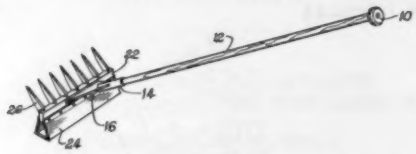
said lifting cylinder being controlled by an output of said third arithmetic means.

4,157,119

MANUAL GRADING TOOL

Everett S. Litchfield, 650-251 S. Rancho Santa Fe Rd., San Marcos, Calif. 92069

Filed Jul. 20, 1977, Ser. No. 817,178
Int. Cl.[2] A01B *1/20*
U.S. Cl. 172—375 **1 Claim**



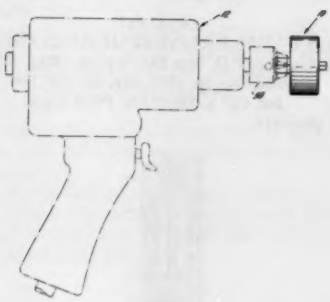
1. In a landscraping and grading tool the combination of:
(a) An elongated handle suitable for manual use while the operator stands in an upright position,
(b) An enlarged portion integral with and positioned at the end of the handle and of such construction that the hands and abdomen of the operator may abut same when applying force to the device,
(c) A base member being a flat, rectangular, bottom portion suitable for contacting the ground and two oppositely disposed substantially vertical side portions integral therewith and extending upwardly therefrom, said base member having a smooth, rounded juncture between the bottom portion and the side portions extending along the entire edge of each side of the bottom portion which broders a side portion and the corresponding bottom edge of each side portion wherein the sides slope inwardly towards each other forming an angle of approximately fifteen (15) degrees in respect to a line perpendicular to the bottom portion, and wherein the height of the side portions is about one and one half times the lateral width of the bottom portion,
(d) A plurality of blades suitable for harrowing the ground, and,
(e) Connecting means secured to the end of the handle opposite that of the enlarged portion and which means retains both the base member and the blades in such space relationship with each other that an operator can cause, alternately, the base member and the blades to contact the ground for comfortable and effective use simply by manually rotating the handle.

4,157,120

ROTARY IMPACT MECHANISM HAVING A SPRING ACCELERATED INERTIA MEMBER

J. Edward C. Anderson, Moreland Hills, Ohio, assignor to Marquette Metal Products Co., Cleveland, Ohio

Continuation of Ser. No. 813,072, Jul. 5, 1977, abandoned. This application Jun. 6, 1978, Ser. No. 913,245
Int. Cl.[2] B25D *15/00*
U.S. Cl. 173—93 **10 Claims**



1. In a rotary impact mechanism of the type comprising an input member, an output member and an inertia member, all approximately symmetrical about a common axis and journaled upon each other at mating mutually telescoping circular surfaces thereof for independent angular movement about said axis, said output member having a plurality of circumferential spaced teeth, at least one pawl carried by the inertia member for angular movement therewith and biased for engagement with said teeth and capable of movement to disengage the teeth, a cam on the input member operative on the pawl as a function of relative angular movement of the input member and inertia member in the direction to force the pawl out of engagement with one tooth of said teeth and release such pawl for engagement with another tooth to impact thereagainst and rotatively drive the output member, the improvement comprising:
(a) the inertia member being disposed within the input member and being of smaller radial dimensions than the radial dimensions of the input member to form therebetween a peripheral recess;
(b) a plurality of helical springs disposed in said peripheral recess and adjacent the outer peripheral surface of the inertia member;
(c) each of the springs being anchored at one end to the inertia member and at the opposite end to the input member so that upon relative rotative movement between the input and inertia members, the springs store energy and thereafter function to rotatively drive said inertia member when the pawl is disengaged from said one tooth; and
(d) a cover overlying said peripheral recess and detachably connected to the input member so as to be removable and thereby expose the springs for removal and/or replacement.

4,157,121

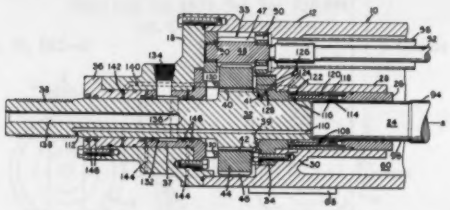
HYDRAULIC POWERED ROCK DRILL

Lester A. Amtsberg, and Paul J. Bilodeau, both of Utica, N.Y., assignors to Chicago Pneumatic Tool Co., New York, N.Y.

Filed Feb. 4, 1977, Ser. No. 765,529
Int. Cl.[2] B25D *9/00*; F01B *7/18*
U.S. Cl. 173—95 **9 Claims**

1. A rock drill including a housing arranged to form an

hydraulic reservoir, a piston means slidingly supported for axial movement within the housing, said piston means having a major diameter portion and a minor diameter portion both of said portions being enclosed within the hydraulic reservoir and subject to the pressure of the fluid in the reservoir, a reciprocable anvil supported in the housing at a forward end thereof, a mechanical hydraulic operated valve means arranged in the housing to control reciprocal movement of the piston means



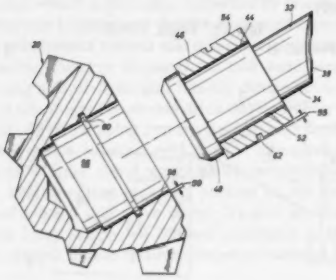
for impact with the anvil, rotation means enclosed in a forward portion of the housing and adapted for selective rotation of the anvil in either rotary direction, a motor means affixed to a backhead plate secured to the housing, a shaft enclosed in the housing and operatively connecting the motor means with the rotation means, and a floating seal means surrounding a portion of both the anvil and the piston and having frictional engagement with the anvil and piston whereby rotational movement of the anvil rotates the piston.

4,157,122

ROTARY EARTH BORING DRILL AND METHOD OF ASSEMBLY THEREOF

William A. Morris, 1110 Central, Houston, Tex. 77012

Filed Jun. 22, 1977, Ser. No. 808,905
Int. Cl.[2] E21B 9/10
U.S. Cl. 175—369 **24 Claims**



1. A method of manufacturing a rotary earth boring drill including assembling a drill cutter, spindle and bearing to establish a nonrotatable retained relation between said bearing and cutter, said method comprising:

providing a spindle defining a bearing surface having inner and outer extremities;

providing a bearing sleeve having a tapered cutter engaging surface formed on said bearing sleeve causing one extremity of said bearing sleeve to be larger than the other extremity thereof and placing said bearing sleeve in rotatable assembly about said bearing surface of said spindle with said other extremity thereof directed toward said inner extremity of said spindle;

providing a rotary drill cutter having a cavity formed therein to receive said bearing sleeve, the deepest portion of said cavity defining the inner extremity of said cavity and the mouth of said cavity defining the outer extremity of said cavity, said cavity being defined at least in part by an internally tapered bearing engaging surface causing the inner extremity of said bearing engaging surface of said cavity to be of larger dimension than the outer extremity thereof;

cooling said bearing sleeve and spindle to reduce the outside dimension of said bearing sleeve;

heating said drill cutter to increase the inside dimension of said cavity;

inserting said assembled and cooled bearing sleeve and spindle into said cavity of said heated drill cutter; and

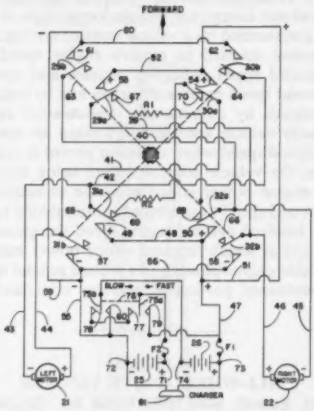
allowing said drill cutter, said bearing sleeve and said spindle to return to normal temperature and dimension to cause a tight retention fit to develop between said bearing sleeve and said drill cutter, whereby a structural interlocking relation is developed between said drill cutter and said bearing sleeve when said one extremity of said bearing sleeve is received at the inner extremity of said bearing engaging surface of said cutter.

4,157,123

WHEELCHAIR ELECTRICAL CONTROL CIRCUIT

Keith S. Rodaway, Santa Monica, Calif., assignor to Everest & Jennings, Inc., Los Angeles, Calif.

Filed Mar. 6, 1978, Ser. No. 883,574
Int. Cl.[2] B62D 11/04
U.S. Cl. 180—6.5 **4 Claims**



1. An electrical control circuit for a wheelchair including left and right d.c. wheel motors, battery means and manually operable switch means for energizing the motors from the battery means, said circuit including, in combination:

(a) a first resistance connected to shunt the negative and positive input leads of the right wheel motor when the portion of the switch means for energizing said right wheel motor is unactuated; and

(b) a second resistance connected to shunt the negative and positive input leads of the left wheel motor when the portion of the switch means for energizing said left wheel motor is unactuated whereby back voltage spikes generated when the motors are deenergized are absorbed in the resistances respectively to thereby protect the switch means against burn-out, dynamic braking is provided when the motors act as generators as a result of the wheelchair coasting, easier steering control is afforded when only one of the motors is energized to effect a turn and permanent magnet type d.c. motors can be utilized for said left and right wheel motors.

4,157,124

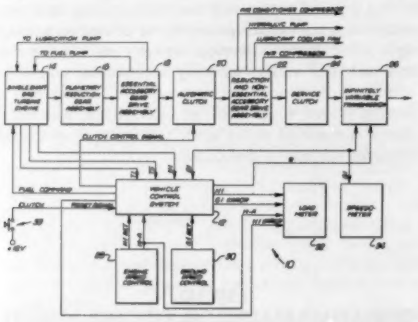
VEHICULAR SINGLE SHAFT GAS TURBINE ENGINE POWER SYSTEM

Bernard B. Poore, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Division of Ser. No. 623,319, Oct. 17, 1075, Pat. No. 4,109,772. This application Nov. 10, 1977, Ser. No. 850,138

Int. Cl.[2] B60K *41/12*

U.S. Cl. 180—105 E **1 Claim**



1. A vehicular single shaft gas turbine engine power system comprising a single shaft gas turbine engine providing rotational energy as an output; an infinitely variable transmission coupled to receive rotational energy from the engine and output rotational energy for vehicle locomotion at a transmission ratio commanded by a vehicle control system; the vehicle control system coupled to receive engine speed indication signals, ground speed indication signals, and operator controlled ground speed command signals and to respond to said received signals by commanding transmission ratios which tend to cause vehicle acceleration toward an operator commanded ground speed when sufficient power is available from the engine, the vehicle control system being operable when sufficient engine power is not available to maintain a commanded ground speed to command a transmission ratio providing at one hundred percent engine speed the greater of a first ground speed at which required vehile power matches maximum available engine power and a second ground speed which is a predetermined portion of operator commanded ground speed.

4,157,125

ALL-WHEEL-DRIVE VEHICLE

Patricia M. Bushell, Blue Hills, Glebe Rd., Headley, Bordon, Hampshire, and Robert C. Bushell, 20 Melville Ct., Guildown Rd., Guildford, Surrey, both of England

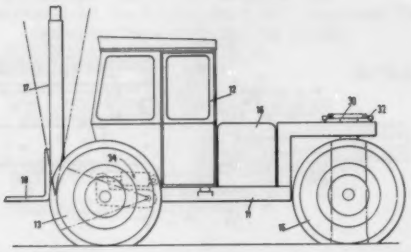
Filed Aug. 17, 1977, Ser. No. 825,308

Claims priority, application United Kingdom, Aug. 18, 1976, 34307/76

Int. Cl.[2] B62D *11/04*

U.S. Cl. 180—26 A **8 Claims**

1. An all-wheel-drive vehicle having at least three wheels, at least one of which is steerable over a steering angle of substantially 90° in each direction, drive means automatically responsive to the steering angle of said at least one steerable wheel for providing synchronous drive to all wheels for zero or small steering angles, differential action means between the steerable and non-steerable wheels for intermediate steering angles whereby the or each steerable wheel is driven faster than the or each non-steerable wheel, and drive is imparted only to the or each steerable wheel for steering angles at or approaching 90°, said drive means further including a hydrostatic system with an individual hydraulic motor for each wheel, fluid pumping means for supplying fluid to said motors, said differential action means including control valves automatically actuable in response to the steering angle of said at least one steerable wheel to control the supply of fluid to said motors, said fluid pumping means being arranged to deliver proportionate fluid supplies to the motors of the steerable and non-steerable wheels for synchronous drive at zero or small steering angles, one of said control valves being arranged automatically to open when a first pre-determined steering angle is exceeded and thereby bridge the fluid supplies for the steerable



and non-steerable wheels to provide said differential action at intermediate steering angles and to close when a second predetermined steering angle is exceeded, and another of said control valves being arranged automatically to open when said second pre-determined steering angle is exceeded and to provide a by-pass for the fluid supply for the non-steerable wheel or wheels such that only the steerable wheel or wheels are driven at steering angles at or approaching 90°.

4,157,126

SYSTEM FOR REGULATING THE TRAVELING SPEED OF A MOTOR VEHICLE

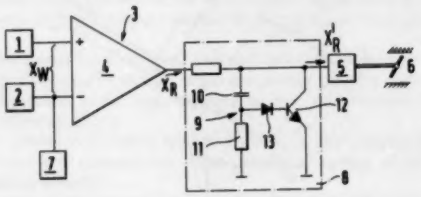
Harald Collonia, Ölmühlweg 13, Königstein, Taunus, Fed. Rep. of Germany (6240)

Filed Nov. 25, 1977, Ser. No. 854,620

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654455

Int. Cl.[2] B60K *31/00*

U.S. Cl. 180—105 E **5 Claims**



1. A system for regulating the traveling speed of a motor vehicle comprising

comparator means for comparing an electrical sensed speed signal representative of the actual traveling speed of a motor vehicle and an electrical reference speed signal representative of a desired traveling speed of the motor vehicle and producing an output signal corresponding to the difference between said sensed speed signal and said reference speed signal;

control means responsive to said output signal for controlling the traveling speed of the motor vehicle; and

selective delay circuit means coupled between said comparator means and said control means for delaying the supply of said output signal to said control means when the amplitude of said output signal is above a predetermined level and for supplying said output signal directly to said control means when the amplitude of said output signal is

below said predetermined level whereby a smooth transition is provided when the desired speed is changed.

4,157,127
FIRE ESCAPE

Akinaga Katsube, 4-9-16-5, Sakuracho, Hatogaya, Saitama, Japan

Filed Sep. 23, 1977, Ser. No. 835,954
Int. Cl.[2] A62B *1/12*
U.S. Cl. 182—5 **6 Claims**

1. In a fire escape having a base member, a brake device mounted to the base member, a flexible elongated member for holding a plurality of escaping persons and a drive device having at least one drive wheel which drives the brake device by frictional engagement with the flexible elongated member, wherein said fire escape comprises:

a contacting member mounted on said base member and apart from said drive device;

an actuator which is pivotally supported by said base member and acts to press said flexible elongated member at an entry side thereof toward said drive device to engage said contacting member disposed on said base member by receiving a force from said flexible elongated member at an exit side thereof from said drive device owing to a total weight of said escaping persons held by said flexible elongated member, wherein said flexible elongated member receives a brake force substantially proportional to the total weight of the escaping persons at the entry side thereof toward said drive device by said actuator and a tension force which has the same strength as the brake force created in said flexible elongated member.

4,157,128
SELF-LOCKING HINGE

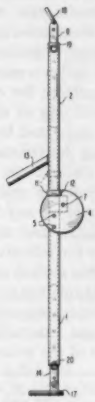
Jack Peters, 24008 Bessemer St., Woodland Hills, Calif. 91364

Filed Dec. 22, 1977, Ser. No. 863,568
Int. Cl.[2] E06C *7/50*; E04C *1/383*; E05C *17/54*; E05D *11/10*
U.S. Cl. 182—24 **29 Claims**

1. A self-locking hinge for use as a pivotal connector between a support member and a pivotal member and adapted to lock said members in a fixed angular relation, said hinge comprising:

a guide means rigidly affixed to opposite lateral faces of said support member to laterally support said support member and rotatably connected to said pivotal member to slidably engage opposite lateral faces of said pivotal member to laterally support and to guide said pivotal member when the pivotal member is pivoted about said rotatable connection; and

a locking means for engaging said guide means to block the angular movement of said pivotal member to lock said

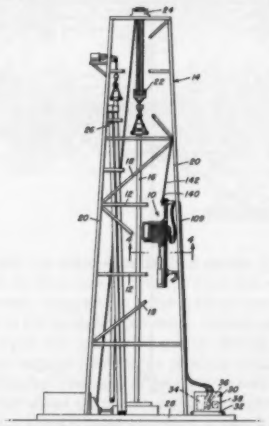


support member and said pivotal member in a fixed angular position.

4,157,129
STABBING BOARD ASSEMBLY

Gordon W. Christopher, P.O. Box 826, Odessa, Tex. 79760

Filed Apr. 26, 1978, Ser. No. 900,301
Int. Cl.[2] E04G *3/10, 3/14*
U.S. Cl. 182—82 **3 Claims**



1. A stabbing board assembly mountable with a derrick including vertical corner posts and horizontal girts; said assembly comprising a pair of parallel laterally spaced vertical H-beam rails, each rail defining opposed side channels and a forward face, a support platform, means mounting said platform on said vertical rails and in outwardly projecting relation thereto for vertical travel of the platform along said rails, said means mounting said platform on said vertical rails comprising upper rollers rotatably mounted on said platform and rollingly locked within said opposed channels for rolling movement solely in a vertical direction relative to said rails, a pair of downwardly and rearwardly angled support bars having upper forward ends thereof rigidly affixed to the platform outward of said vertical rails, and lower rollers rotatably mounted on the lower rear ends of said bars, said lower rollers freely resting against said forward faces of said rails in vertically spaced relation below said upper rollers to support and horizontally

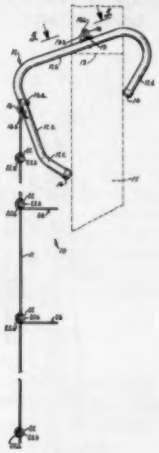
maintain said platform, vertically acting power means engaged with said support platform for vertically adjusting said support platform along said vertical rails, said vertically acting power means comprising hydraulic ram means engaged with said vertical rails generally therebetween and below said support platform, said ram means projecting vertically into engagement with said platform, and arm means rigid with said vertical rails and projecting therefrom for engagement with selected derrick girts for the mounting of the assembly thereon, said arm means comprising upper and lower arms associated with each rail and projecting horizontally therefrom, each arm including an inner end fixed to the associated rail, each arm being longitudinally adjustable and including means for the fixing of the arms selectively in any one of a plurality of longitudinally adjusted positions, and an outer end on each arm including bracket means for selective securing of the arms to selected girts, an extensible section mounted on and selectively extensible and retractable relative to said support platform, and horizontally acting hydraulic ram means engaged between said support platform and said extensible section for a selective extension and retraction of the extensible section.

4,157,130

FIRE LADDER AND METHOD OF CONSTRUCTING SAME

James B. Aberer, Lake Winnebago, Mo., assignor to Rival Manufacturing Company, Kansas City, Mo.

Filed Mar. 24, 1978, Ser. No. 889,629
Int. Cl.[2] E06C *1/56, 1/36*
U.S. Cl. 182—198 **1 Claim**



1. In a ladder having a pair of flexible opposite sides and a plurality of rigid rungs extending between said sides, the combination therewith of:

a pair of arm members connected with the respective sides and formed to engage a support member in a manner to suspend said sides in downward extension therefrom;

a hinge member extending between said arm members and coupling same together for folding movement between a first position wherein said arm members are spaced apart to engage the support member, and a second position wherein said arm members are disposed in close proximity to one another for storage;

wherein said hinge member includes said hinge member having a pair of hinge arms pivotally coupled with the respective arm members and coupled generally end to end with one another, said hinge arms being foldable about their adjoining ends to move said arm members between said first and second position;

means for urging said hinge arms to a position wherein said hinge arms form a substantially straight structure extending between said arm members; and

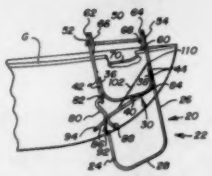
wherein said hinge arms are substantially hollow and said urging means comprises a spring coupled with each hinge arm internally thereof and acting to pull said hinge arms toward one another in a manner to yieldably retain said hinge arms in the substantially straight position.

4,157,131

BOAT BOARDING LADDER

Robert J. Bazyk, 4161 Eastern, Nevada Las Vegas Mission, Box 19743, Las Vegas, Nev. 89119

Filed Mar. 9, 1978, Ser. No. 884,821
Int. Cl.[2] E06C *1/36, 7/48*
U.S. Cl. 182—206 **3 Claims**



1. A boat boarding ladder for engagement to the gunwale of a boat, comprising:

a frame having at least one rung thereon, said frame member including upstanding legs interconnected at one end by said rung,

a support member pivotally attached adjacent one end of said frame, said support member including a U-shaped member having side legs interconnected by a transverse member, said legs of said support member being pivotally attached to said upstanding legs of said frame and being curved out of the plane of said frame, and

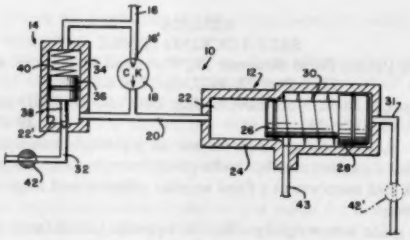
means attached to said frame for arresting the rotation of said support member relative to said frame such that the gunwale of the boat may be engaged between said support member and said frame with the support member within the boat and the frame outside the boat.

4,157,132

LUBRICATOR

Leo Kramer, Lambertville, N.J., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 16, 1977, Ser. No. 861,124
Int. Cl.[2] F16N *25/02*
U.S. Cl. 184—7 D **15 Claims**



1. A lubricator, comprising:

first means, for communication with a source of lubricant, for conducting lubricant therealong, in a given direction, for lubricating an apparatus;

second means, movably interposed in said first, conducting

means, for preventing lubricant flow counter-current to said given direction; wherein

said second means includes third means, movable between a first positioning thereof, for closing off said conducting means to lubricant flow, and a second positioning thereof for opening said conducting means to lubricant flow;

said third means comprises a bearing surface reactively responsive to a pressured-fluid force to move said third means from one of said first and second positionings to the other of said postionings; and

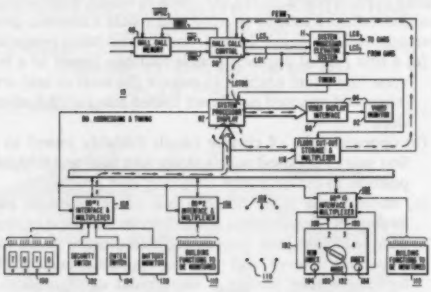
means coupled to said third means operative for supplying pressured lubricant to said bearing surface.

4,157,133

ELEVATOR SYSTEM

Harold L. Corcoran, Lyndhurst, N.J.; Kenneth M. Eichler, North Versailles, and Alan F. Mandel, Scott Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 24, 1978, Ser. No. 899,196
Int. Cl.[2] B66B *3/00*
U.S. Cl. 187—29 R **16 Claims**



1. An elevator system, comprising:

a building having a plurality of floors,

an elevator car mounted in said building to serve the floors therein,

call means for registering calls for elevator service,

control means responsive to said call means for directing the movement of said elevator car to serve calls for elevator service registered on said call means,

visual display means responsive to said call means and said control means for displaying selected dynamic parameters of the elevator system,

building floor security means providing a plurality of signals, with each of said signals being in a selected one of two conditions,

said building floor security means including first means for selecting the conditions of its signals to provide a floor cut-out signal for a selected floor,

and memory means for storing each floor number for which a floor cut-out signal is generated,

said control means being responsive to said memory means for preventing elevator service to the cut-out floors in response to said call means,

said security means including second means operatively connected to said display means for selectively causing said display means to visually display the cut-out floors currently stored in said memory means.

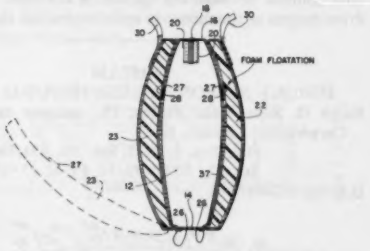
4,157,134

BAG WITH LIFE PRESERVING BUOYANT MEANS

Charles Stoll, 8 Langereis Dr., Monsey, N.Y. 10952

Filed May 8, 1978, Ser. No. 903,833
Int. Cl.[2] A45C *9/00*
U.S. Cl. 190—1 **6 Claims**

1. A bag with life preserving buoyant means comprising a waterproof bag; a pair of buoyant floatation members, each externally hinged to said bag; mating detachable fastening



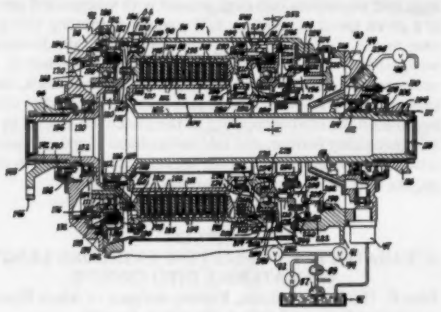
means for securing said members to the sides of said bag; with a handle fixed on each said member.

4,157,135

CLUTCH LOCK-UP MECHANISM

Robert E. Devlin, Indianapolis, and Frank W. Janneck, Danville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1977, Ser. No. 853,178
Int. Cl.[2] F16D *23/04, 23/10*
U.S. Cl. 192—53 B **4 Claims**



1. A clutch unit for association with an engine driven propeller assembly to control power transfer from the engine to the propeller assembly comprising: a drive input from the engine, a drive output to the propeller assembly, clutch means coupled to said drive input and said drive output having a disengage position and an engage position to produce clutch slip upon initial power transfer from said drive input to said drive output to accelerate the drive output to a speed synchronized with that of said drive input, means including a clutch piston valve for selectively positioning said clutch means in its engage and disengage positions, means for sensing synchronous drive between said drive input and said drive output as produced following initial clutch energization, first and second spline rings connected respectively to said drive input and said drive output, means including an intermediate spline member carried by said first spline ring and axially movable with respect to said second spline ring to lock the drive input to said drive output to thereby unload said clutch means following synchronous speed of operation between the drive input and said drive output, and means for directing a torsional force to said intermediate spline member for maintaining a bias thereon to load the intermediate spline member and first and second spline rings together, said intermediate spline member and second spline ring being axially movable and said first and second spline rings and intermediate spline member being helical and having a backlash formed therebetween to permit relative circumferential motion of the intermediate spline member into

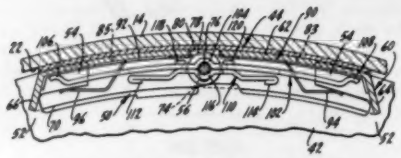
an open mesh position with respect to said first spline ring as said second spline ring moves axially toward said first spline ring thereby to compensate for circumferential spline tooth misalignment between the splines on the drive input and the drive output at synchronous speed operation therebetween.

4,157,136

TORQUE RESPONSIVE CENTRIFUGAL CLUTCH

Ralph D. Salle, Lake Zurich, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 9, 1977, Ser. No. 831,728
Int. Cl.[2] F16D *43/14*; F16H *45/02*
U.S. Cl. 192—103 B **7 Claims**



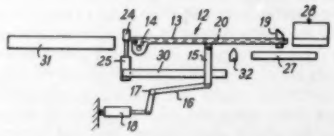
1. An engaging mechanism operating in a fluid environment comprising, first and second relatively rotatable members, an annular disc fixed to said first member, a plurality of streamlined shaped sheet metal shoe assemblies mounted in said disc, cam means on said disc, said assemblies including means in engagement with said cam means, centrifugal force acting to urge said assemblies into engagement with said second member at a given speed of rotation, said assemblies moving along said cam means after initial engagement whereby said devices are wedged between said disc and said second member to self-energize and increase the torque capacity of the clutch, torque limiting means associated with said cam and assemblies operating to limit the torque capacity of the clutch developed by said self-energizing feature, and said streamlined shape cooperating with said fluid environment during operation to assist in disengaging said shoes from the wedging position.

4,157,137

APPARATUS FOR COLLECTING EXTRUDED LENGTHS OF MATERIAL INTO GROUPS

Jean P. Hardouin, Luisant, France, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Nov. 23, 1977, Ser. No. 854,382
Claims priority, application United Kingdom, Nov. 23, 1976, 48864/76
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—418 **7 Claims**



1. Apparatus for collecting lengths of material in side by side relation into a group and delivering the group to a receiving station, comprising a support table which is tiltable by one edge about a horizontal axis between a horizontal position and a position inclined downwardly towards said one edge, a stop adjacent said one edge of the support table, means for tilting said table, fingers mounted on the support table and movable towards and away from said axis for moving lengths of material on the support table towards said stop, means for moving said fingers toward and away from said stop whereby said fingers move the lengths of material when said table is in the inclined position, means for emitting a signal when the lengths of material disposed side by side on the support table have a predetermined total width, means for moving lengths of material laterally of themselves on to the table in a direction towards the stop, and means initiated by the signal for removing the group of lengths of material in their side-by-side formation from the table past the stop to the receiving station.

4,157,138

WRAPPER FOR AN ARTICLE OF MERCHANDISE

Ronnie D. Duncan, Muskogee, Okla., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 13, 1978, Ser. No. 885,481
Int. Cl.[2] B65D *5/35*
U.S. Cl. 206—315 R **4 Claims**

1. In a wrapper for a long article of merchandise such as the hull of a double ended watercraft such as a canoe or the like, said wrapper being formed from a plurality of cut and scored blanks of paperboard, or the like, each of which when folded to position defines a tube to envelop said article a distance greater than one-half the length thereof, each of said tubes comprising:

(a) a first pair of opposed panels foldably joined to a transverse end panel adapted to engage the ends of said article when said opposed panels are folded into parallel relationship;

(b) opposed pairs of closure panels foldably joined to said first pair of opposed panels along fold lines and foldable to position to define a tube enclosing said article;

(c) at least one panel of each pair of said closure panels having an edge oriented diagonally to and located remote from said fold lines connecting said closure panel to the respective one of said pair of opposed panels thereby forming a tube having a trapezoidal configuration and substantially conforming to the shape of said article;

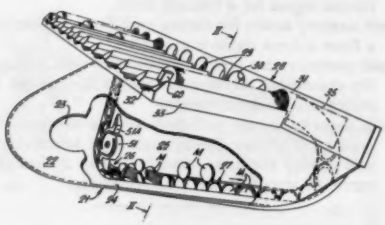
(d) each of said tubes being placed in reverse end-to-end relationship with the aforesaid panels in telescoping relationship to enclose said articles.

4,157,139

APPARATUS FOR SORTING AND/OR HANDLING DISC-LIKE MEMBERS

Svante T. Björk, Kungsbacka, Sweden, assignor to Bertil Knutsson, Göthenborg, Sweden, a part interest

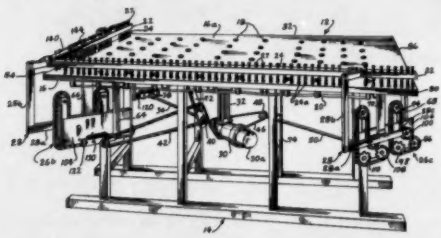
Filed Dec. 22, 1977, Ser. No. 863,248
Claims priority, application Sweden, Dec. 28, 1976, 7614608
Int. Cl.[2] B07C *5/342*
U.S. Cl. 209—552 **17 Claims**



1. Device for sorting discs of different identities, said device comprising: (a) a feed receptacle for receiving discs to be sorted, (b) conveyor means for withdrawing discs individually from the feed receptacle and moving them in succession along a sorting track, (c) a plurality of disc receiving spaces disposed along the sorting track, each receiving space being intended

for receiving and stacking discs of a particular identity, (d) identifying means for assessing the identity of each withdrawn disc, and (e) transfer means controlled by the identifying means for transferring discs disposed on the sorting track to the receiving spaces in accordance with the identity as established by the identifying means, characterized in that (1) the conveyor means comprises an endless, continuous conveyor passing through the feed receptacle and having a plurality of successive discs carriers to be occupied by a disc in the feed receptacle, (2) the receiving spaces are disposed adjacent the sorting track and the path of the disc carriers, (3) the transfer means comprise, in the region of each receiving space an individually operable disc deflecting mechanism which is shifable under the control of the identifying means between an inactive position to permit discs on the disc carriers of the conveyor to pass the receiving spaces and an active position to deflect toward the lower end of a receiving space a disc occupying a disc carrier approaching that receiving space, and (4) at the bottom of each receiving space a disc stack support is provided having a disc catching member which is disposed below the adjacent portion of the disc when the adjacent portion is in the deflected position.

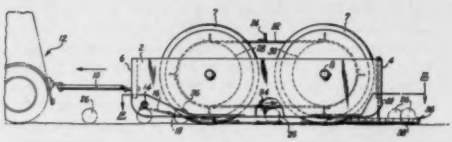
4,157,140
RETRACTABLE AUTOMATIC SELF-ADJUSTING CLAMPING MEANS
Paul J. Glasgow, 886 Lakeside Dr., Woodmere, N.Y. 11598
Filed Dec. 13, 1977, Ser. No. 860,127
Int. Cl.[2] B65G *7/06*
U.S. Cl. 414—676 **12 Claims**



1. Retractable clamping means for clamping sheet laminates and other forms of work, said clamping means comprising:
(a) a table having a work supporting surface,
(b) a plurality of spring-biased work clamping elements,
(c) a floating framework supporting said work clamping elements in a substantially common plane and being movable integrally with them, and
(d) reversibly driven carrier means carrying said floating framework and the work clamping elements supported thereby,
(e) said carrier means being driven to move the floating framework and work clamping elements upwardly from retracted position below said work supporting surface, then downwardly to work clamping position above said work supporting surface, then upwardly from said work clamping position, and then downwardly back to said retracted position.

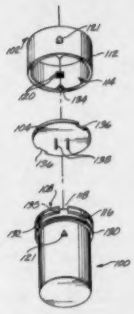
4,157,141
GOLF BALL PICK-UP APPARATUS
Timothy A. Ryan, 1607 Pine St., Harlan, Iowa 51537
Filed Sep. 26, 1977, Ser. No. 836,769
Int. Cl.[2] B60P *1/00*
U.S. Cl. 414—440 **6 Claims**

1. A golf ball pick-up apparatus comprising:
a carriage adapted to be moved over the ground;
a flexible mat having its forward edge secured to a front portion of said carriage and at an elevation thereon greater than the height of a golf ball, said mat having a multiplicity of openings therethrough whereby golf balls on the ground will pass upwardly through said openings to the upper surface of said mat as said carriage and mat are moved forwardly over the ground;
a container on the rear portion of said carriage and adjacent the rear edge of said mat;



sweep means on said carriage for sweeping golf balls rearwardly over said mat to said container;
said mat comprising a group of abutting rings, each having an inner diameter slightly greater than a golf ball, with each ring pivotally linked to adjacent rings at their points of tangency.

4,157,142
SAFETY CONTAINER OPENING MEANS
Cheung T. Kong, 269 S. Lafayette Park Pl., Apt. 304, Los Angeles, Calif. 90057
Filed Jul. 31, 1978, Ser. No. 929,261
Int. Cl.[2] B65D *55/02, 85/56;* H61J *1/00*
U.S. Cl. 215—223 **2 Claims**



1. In a combination for containing medicine and the like, which includes a container having a mouth defining a circular access opening, and a container cap having a cover wall and a side wall projecting from the cover wall to define a container-receiving cylindrical recess, apparatus for releasably securing the cap to the container so as convertibly to define alternative precautionary and easy open arrangements, the apparatus comprising:
cooperating locking means for use in the precautionary arrangement to ensure that the cap can be separated from the container only when the cap is aligned in predetermined angular relationshp with the container, the locking means including a pair of tab means on the cap, and locking rim means on the container surrounding the access opening, the locking rim means having a pair of circumferentially spaced apart notches, each of the tab means projecting into the recess from a circumferentially spaced apart portion of the side wall and each including a pair of axially spaced apart lugs;
a member movable within the recess to select between the precautionary and easy open arrangement;
means including said lugs for use in the easy open arrangement to support the member parallel to and spaced from the cover wall such that the member occupies a plane

parallel to and spaced from the cover wall, said plane dividing the side wall into a lower skirt-defining portion and an upper portion surrounding a chamber defined between the tab means and the cover wall;

a sealing ring on the container parallel to and spaced from the locking rim means such that there is defined, between the locking rim means and the sealing ring, a groove for receiving the tab means in the precautionary arrangement and such that, in the easy open arrangement, the sealing ring contacts the skirt portion of the side wall; and

the member, while occupying said plane, acting as a stop limiting travel of the container into the recess so that in the easy open arrangement the locking means do not engage, and the member being movable into the chamber to enable further travel of the container into the recess so that in the precautionary arrangement the locking means are engageable.

4,157,143

SALES PROMOTING-PURPOSE BOTTLE CLOSURE

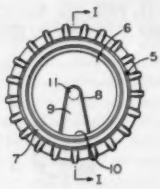
Kouichi Doi, Inuyama, Japan, assignor to Japan Crown Cork Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1978, Ser. No. 886,579

Claims priority, application Japan, Sep. 26, 1977, 52/128448[U]

Int. Cl.[2] B65D *53/04*

U.S. Cl. 215—228 **3 Claims**



1. A sale promoting-purpose closure comprising:

a closure shell having a visable indicia on the inner bottom surface thereof; and

a gasket peelably bonded to said inner bottom surface of said closure shell, said gasket having a center panel with a tear strip portion defined therein by a breakable line, whereby said tear strip portion may be separated from said inner bottom surface along said breakable line and be used to completely peel off the entire gasket.

4,157,144

STERILE CLOSURE CAP

Herbert Weiler; Hans Schneider, and Ludwin Weyrich, all of Marburg an der Lahn, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

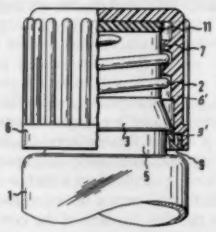
Filed May 9, 1978, Ser. No. 904,245

Claims priority, application Fed. Rep. of Germany, May 11, 1977, 7714894

Int. Cl.[2] B65D *41/34*

U.S. Cl. 215—252 **12 Claims**

1. A sterile closure including, in combination, a flask having a neck, including a first threaded portion and a frustroconical ring formed therein surrounding the neck below said threaded portion and defining a downwardly facing annular shoulder; and a closure cap including a peripheral skirt having an internal thread configuration which is generally complementary to the threaded portion of the container neck; said skirt including a free end having an internal annular recess formed therein and being dimensioned such that said recess is below the level of the shoulder when the cap is threaded on the neck of the flask; and an annular tamper-proof ring press-fit in said recess, said ring being generally U-shaped in cross-section and including a pair of legs, one of said legs being received in said recess and the other of said legs extending parallel thereto but inwardly of the inner surface of the skirt whereby said other leg will be



located directly below said shoulder when the cap is mounted on said neck.

4,157,145

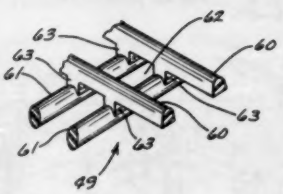
SILVERWARE BASKET CONSTRUCTION

Lawrence J. Jordan, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Jul. 17, 1978, Ser. No. 925,212

Int. Cl.[2] B65D *7/20, 7/42*

U.S. Cl. 220—19 **8 Claims**



1. A silverware basket for use in a dishwashing apparatus, having perforate side and bottom walls wherein the improvement comprises: an offset grid arrangement forming at least one of said walls which includes a first plurality of elongated ribs in a first plane and a second plurality of elongated ribs extending at an angle to said first ribs in a second generally parallel plane sufficiently spaced from said first plane to avoid contact of the facing surfaces of said first and second ribs, said grid further including means extending generally transversely between said planes for connecting said ribs at their projected intersection points to form said offset grid.

4,157,146

SAFETY CLAMPING SYSTEM FOR PRESSURE VESSEL CLOSURES AND THE LIKE

Bert N. Svenson, 9259 Raviller Dr., Downey, Calif. 90240

Filed Sep. 25, 1978, Ser. No. 945,089

Int. Cl.[2] B65D *45/16*

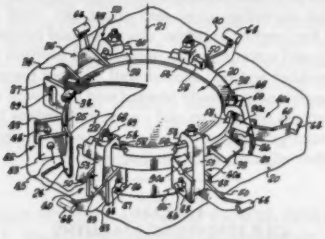
U.S. Cl. 220—324 **41 Claims**

1. In combination with a chamber having an aperture surrounded by a seat, a closure member for the aperture, a plurality of clamping devices angularly spaced about the aperture periphery and actuable selectively to clamp and to release the closure member, and hinge means at one side of the closure member pivotally connecting the closure member and the chamber; the improvement comprising

means associated with the hinge means for allowing limited translational movement of the closure member away from the seat to equalize pressure in the chamber,

and means associated with at least one of said clamping

devices approximately opposite the hinge means for obstructing release of that one clamping device until all



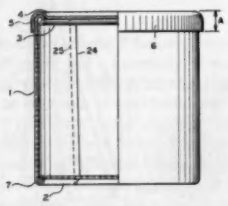
clamping devices nearer the hinge means have been released.

4,157,147

CONTAINER

Laurence R. DeForest, Gladstone, Mo., and Frank P. Richards, Prairie Village, Kans., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 30, 1977, Ser. No. 782,689
Int. Cl.[2] B65D *3/04, 3/12, 5/56, 5/62*
U.S. Cl. 220—455 **3 Claims**



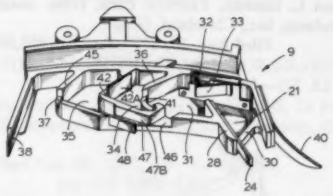
1. A container having a cylindrical tubular sidewall; a bottom closure secured to said sidewall to seal the bottom end of the container; a rim being circumferentially continuous about the periphery of the top end of the container and being disposed completely within the confines of the tubular sidewall and comprising an upper end portion of the sidewall extending inwardly, downwardly, and outwardly so that the edge of the inner surface of the upper end of the sidewall is in a position which is higher than the lowest portion of said rim; and a top closure bonded to the upper surface of said rim so that a continuous line of bonding around the upper end of the container is provided; wherein said sidewall is constructed from a paperboard blank comprising a single ply of paperboard base stock having a thickness in the range of about 14 to about 28 mils and a basic weight of about 180 to about 360 pounds per 3,000 square feet; wherein said paperboard blank has a coating of thermoplastic on both surfaces thereof; wherein the opposite side edge margins of the paperboard blank are secured by heat sealing the thermoplastic coating on said blank in the area where the opposite side edge margins overlap; wherein the bottom closure comprises a generally circular paperboard disk having a skirt depending therefrom which skirt abuts the inner surface of the lower end of said sidewall, said bottom closure also having a coating of thermoplastic on both surfaces thereof; and wherein said bottom closure is secured to said sidewall by having the lower end of said sidewall crimped inwardly so that the inner side of said lower end of said sidewall is in contact with both the inner and outer surfaces of said flange and by having the thermoplastic on the inner side of the lower end of said sidewall heat sealed to both sides of said flange to provide on both sides of said flange a generally continuous line of bonding around the circumference of said flange; and wherein said top closure comprises generally circular paperboard having integral therewith a flange portion which extends downwardly around and in contact with the total circumference of a portion of the exterior surface of the upper end of said container sidewall, said flange being bonded to the exterior surface of said container at all points of contact therewith; and wherein said top closure has a coating of thermoplastic on its bottom side which is heat sealed to said rim to provide said continuous line of bonding around the upper end of the container and wherein said top closure is constructed from a flat paperboard disk having on its bottom surface a plurality of score lines around its circumference with each score line extending from the outer perimeter of the disk radially inwardly a distance substantially equal to the dimension of said flange portion of said top closure.

4,157,148

MODIFIED FEED FRAMES FOR TABLETING MACHINE

Gilbert H. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 11, 1977, Ser. No. 814,541
Int. Cl.[2] B30B *11/08*
U.S. Cl. 222—346 **8 Claims**



1. An apparatus for feeding pharmaceutical powders to successively presented tableting dies and comprising a hollow enclosure positioned on a die carrying table for relative movement with respect thereto, said enclosure including a wall trailing with respect to said relative motion for scraping powders within said enclosure into successively presented dies, and said enclosure having an exit opening therefrom at the radially inner end of said wall, the improvement comprising:

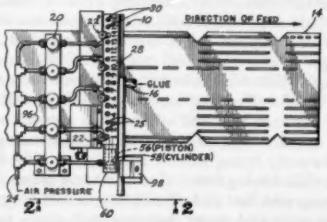
a relief opening from said enclosure through a wall thereof which is radially inwardly of said above-named exit opening for permitting the escape from said enclosure of powder in excess of that which is able to escape through said above-mentioned exit opening.

4,157,149

MULTIPLE NOZZLE FLUID DISPENSER FOR COMPLEX FLUID DELIVERY PATTERNS

Lenard E. Moen, 7914 Michigan, Whittier, Calif. 90602

Filed Oct. 31, 1977, Ser. No. 846,899
Int. Cl.[2] B67D *3/00;* **F16K** *31/00*
U.S. Cl. 222—486 **13 Claims**



1. A multiple valve assembly comprising:

a body including a plurality of valves with a corresponding plurality of valve seats;

at least a first one of said valves including a laterally flexible valve stem having a valve element at one end moveable into and from engagement with a corresponding valve seat by lateral deflection of said valve stem to open and close a corresponding valve;

at least one independently actuable one of said valves including a valve rod having a valve element at one end moveable into and from seating engagement with a corresponding valve seat by axial movement of said valve rod to open and close the corresponding valve;

a valve actuator for each independently actuable valve secured to the opposite end of the corresponding valve rod to move the latter axially;

said body containing a bore traversed by each valve stem and valve rod; and

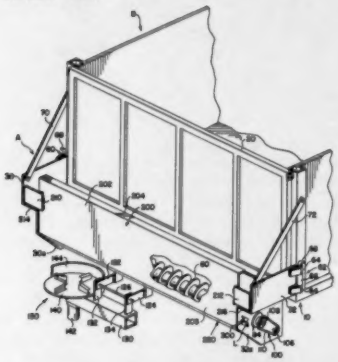
an operating means for said at least one first valve moveable in said body bore for exerting lateral deflecting forces on said flexible valve stems only.

4,157,150

HOPPER DEVICE FOR MATERIAL SPREADER HAVING A MULTIPOSITIONABLE COVER

Vernon L. Hetrick, Fairview Park, Ohio, assignor to Meyer Products, Inc., Cleveland, Ohio

Filed Nov. 29, 1977, Ser. No. 855,541
Int. Cl.[2] B67D 5/06
U.S. Cl. 222—626 **19 Claims**



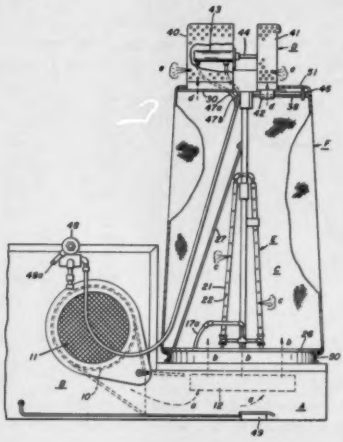
1. In a hopper device for mounting transversely across the material discharge end of a vehicle mounted dump bed adapted to contain particulate material to be spread over a roadway being travelled by said vehicle, said hopper device including fixed first and second spaced end walls, a fixed back wall connected to said end walls, an elongated auger extending between said end walls, means for rotating said auger about an axis generally parallel to said back wall for conveying said material toward said first end wall, and a cover member extending between said end walls, said cover member being movable between a first spreading position forming a front wall for said hopper, a second dumping position forming a top wall for said hopper, and a third cleaning position exposing said auger, the improvement comprising: said cover member including a first wall member having an outwardly facing surface defining first and second generally parallel edges extending between said end walls and a second wall member fixed to said first wall member at an angle extending away from said outwardly facing surface and adjacent said first edge; at least one link having first and second ends; means for pivotally connecting said first end of said link to said cover on an axis movable with said cover, between said edges and generally parallel to said auger axis; means for pivotally connecting said second end of said link to an axis generally fixed on said hopper device and parallel to said movable axis adjacent said back wall; first locator means for releasably securing said cover member in said first position with said first wall member generally parallel to said back wall and said second wall forming the bottom of said hopper; second locator means for releasably securing said cover member in said second position with first wall member extending over said auger and from said discharge end for forming an upper cover for said hopper; means for securing said cover member in said third position with said first wall member and said second wall member pivoted away from said auger and generally toward said back wall to form a transverse access opening to said auger; and, means forming a material discharge opening in said second wall member of said cover member adjacent said first end wall.

4,157,151

CAP FINISHING MACHINE

John R. Sanko, Altoona, Pa., assignor to Paris Manufacturing Company, Inc., Brockway, Pa.

Filed Jun. 9, 1978, Ser. No. 914,150
Int. Cl.[2] A42C 1/04
U.S. Cl. 223—13 **5 Claims**



1. In a finishing machine for a head covering in the nature of a cap or the like having an air chamber defining support base, a central post extending upwardly from and supported on the base, and an upper platform mounted on the post; wherein the platform has a through-extending central open portion, the support base has a heat exchanger across its chamber for heating air therewithin and has an upper open mouth portion, and means is cooperatively positioned with respect to the support base for drawing air through the heat exchanger and thereafter positively moving heated air upwardly and discharging it from the upper open mouth portion of the support base, the improvement which comprises: a non-permeable enclosing bag extending upwardly from and positioned between the support base and the platform in a chamber-defining relation about the central post, said bag having an open lower end portion adapted to fit about the upper open mouth portion of the support base and having an open upper end portion adapted to fit about the central open portion of the platform, a separator for separating steam being supplied into fully dry steam and lower quality less-dry heat-supplying steam, an upright tubular assembly mounted along the post and provided with a series-connected group of inner tubes through which the lower quality steam is continuously moved from said separator and thereafter supplied to the heat exchanger for heating air within the chamber of the support base before its introduction into the chamber defined by said bag, said tubular assembly having a group of perforated tubes positioned in an outwardly spaced relation along said inner tubes for receiving bursts of the fully dry steam from said separator and directly introducing dry

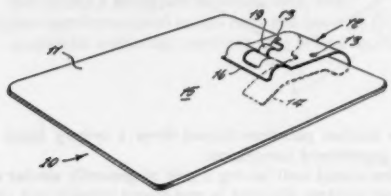
steam centrally into and along the chamber of said bag, a pair of horizontally adjustable cap-receiving and forming parts of hollow perforated wall construction positioned on the upper platform above its central open portion to receive heated air and dry steam from said open upper end of said bag for their direct introduction into the interior of a cap positioned on said forming parts, and means for relatively moving said forming parts on the platform inwardly and outwardly on a substantially plane with respect to each other to enable receiving and stretching the cap to be finished thereon.

4,157,152

GOLF SCORE CARD AND PENCIL HOLDER

Douglas V. Blastic, 115 Princeton La., Logansport, Ind. 46947

Filed Apr. 11, 1977, Ser. No. 786,661
Int. Cl.[2] B60R *11/00*
U.S. Cl. 224—247 **3 Claims**



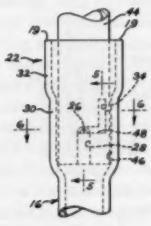
1. A golf score card and pencil holder, comprising, in combination, a flat stiff panel and a generally U-shaped single piece leaf spring being placed around one end of said panel and having one leg on one side of said panel and the other leg on the other side of said panel; said one leg being secured upon said one end of said panel; one end of said other leg of said leaf spring being rounded and turned in toward the other side of said panel in spaced-apart relation with said other side of said panel, forming a resilient hook for support upon the top edge of a golf bag; the end of said one leg including a lip turned upon its terminal edge so a score card can be resiliently held between said end of said one leg and said one side of said panel; and said one leg of said leaf spring incorporating means for removably and resiliently supporting a writing pencil, said pencil supporting means comprising a rounded tab struck-out centrally from and spaced adjacently to the end of said one leg for resilient and removable retention of a writing pencil, said single piece leaf spring thereby providing a spring force for resilient and removable retention of a score card and a pencil and for resilient mounting to a golf bag top edge.

4,157,153

ALUMINUM TUBE JOINT DESIGN

David A. Barnes, Troup, Tex., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 8, 1978, Ser. No. 884,524
Int. Cl.[2] B23K *1/08*
U.S. Cl. 228—136 **5 Claims**



1. A method of joining metal tubes comprising:

providing a female metal tube member having a flared cup end portion;

providing a male metal tube member having an end portion dimensioned to be received by said cup portion and to seat against an inner surface of said flared cup portion;

forming a plurality of nibs spaced apart circumferentially on the outer surface of said male member and extending radially outwardly therefrom whereby the diameter of said male member defined by the distal ends of said nibs is greater than the diameter defined by the inner surface of said cup end portion, said nibs being spaced from said distal end, and also forming at least one groove on said outer surface extending longitudinally of said male member between said distal end and said nibs;

telescoping said tube members and inparting a rotational motion to said male member so that said nibs form a locking groove that extends longitudinally and circumferentially in the inner surface of said cup portion;

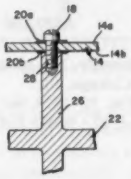
flowing molten filler alloy into said cup portion, and thereafter solidifying said alloy.

4,157,154

METHOD FOR FORMING PATTERNS OF BRAZING ALLOY

James K. Scott, Anaheim, and Theodore C. Schmidt, La Palma, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 21, 1977, Ser. No. 853,693
Int. Cl.[2] B23K *1/04*
U.S. Cl. 228—140 **8 Claims**



1. A method for forming brazed joints between component parts comprising the steps of utilizing a brazing alloy coating on at least one of the parts, removing the brazing alloy from selected areas on the coated part for providing a joint pattern configured as the brazed joint, and joining and brazing the parts together.

4,157,155

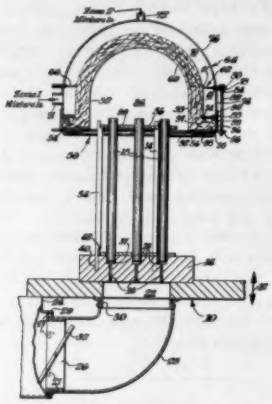
SEALING APPARATUS AND METHOD

Thomas M. Smith, 114 Villinger Ave., Cinnaminson, N.J. 08077

Continuation-in-part of Ser. No. 701,687, Jul. 1, 1976, abandoned, and Ser. No. 775,838, Mar. 9, 1977, and Ser. No. 863,251, Dec. 22, 1977, said Ser. No. 701,687, and said Ser. No. 775,838, is a continuation-in-part of Ser. No. 674,409, Apr. 7, 1976, Pat. No. 4,035,132. This application May 15, 1978, Ser. No. 906,229
Int. Cl.[2] B23K *1/12, 3/04*
U.S. Cl. 228—183 **8 Claims**

4. A process for simultaneously brazing a plurality of metal heat exchange tubes in a metal tube sheet, which process comprises, holding an assembly of such tubes each having one end in a sheet with the sheet in essentially horizontal position and carrying on its upper surface a quantity or brazing metal adequate to seal all tubes into the sheet, applying radiant heat downwardly on the sheet to heat essentially only the top of the assembly to bring the sheet at least to the fusion point of the

brazing metal, and moving gases from above the tube ends down through the tube ends during the heating to cause the



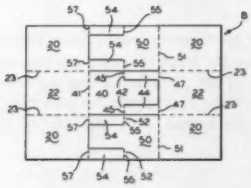
heating to be more uniformly applied to the tubes so that the sealant rapidly seals all tubes to the sheet.

4,157,156

PARTITION ARRANGEMENT

Boyd T. Skaggs, Louisville, Ky., assignor to Container Corporation of America, Chicago, Ill.

Filed Feb. 10, 1978, Ser. No. 876,523
Int. Cl.[2] B65D *5/48, 25/04*
U.S. Cl. 229—15 **2 Claims**



1. A partition, formed of a unitary blank of foldable paperboard, for forming six cells within an outer package, comprising:

(a) a pair of vertically disposed transverse members spaced from each other in parallel relation and having lower edges foldably joined to each other by a bottom member;

(b) said bottom member and said transverse members each including a pair of panels aligned with each other in end-to-end relation;

(c) a vertically disposed longitudinal member including a center section located intermediate said transverse members and a pair of end sections located outboardly of respective transverse members;

(d) said center section including a pair of panels foldably joined to each other and to inboard edges of respective bottom member panels;

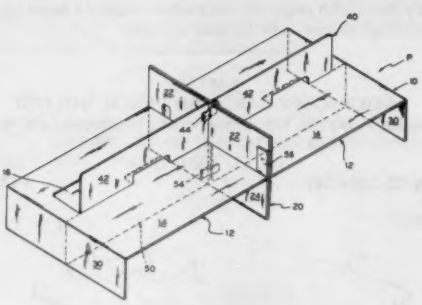
(e) each of said end sections including a pair of panels foldably joined to each other and to inboard edges of respective panels of a related transverse member.

4,157,157

INTERNAL PARTITION

Harry E. Young, Houston, Tex., assignor to Container Corporation of America, Chicago, Ill.

Filed Aug. 4, 1978, Ser. No. 930,929
Int. Cl.[2] B65D *5/48*
U.S. Cl. 229—28 R **5 Claims**



1. An internal partition formed from a unitary blank of foldable paperboard comprising:

(a) a horizontal wall having a pair of generally similar co-planar sections disposed in end-to-end relation and each including a pair of upper and lower panels foldably joined to each other along common side edges and folded in face-to-face relation;

(b) a transversely extending vertical wall disposed between said horizontal wall sections and having a pair of generally similar co-planar upper and lower sections each including a pair of panels disposed in face-to-face relation with outer edges foldably joined to each other and with inner edges foldably joined to adjacent edges of related horizontal wall panels;

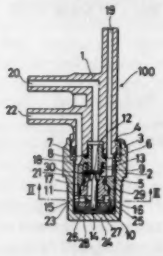
(c) a pair of longitudinally extending upper and lower vertical walls located on opposite sides and centrally of said horizontal wall and each including a pair of panels disposed in end-to-end relation with each panel of each pair being foldably joined at an inner edge to an adjacent edge of a related panel of said horizontal wall.

4,157,158

TEMPERATURE RESPONSIVE VALVE ASSEMBLY

Kazuhiko Kitamura, Toyota, and Masami Inada, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jan. 18, 1978, Ser. No. 870,355
Claims priority, application Japan, Jan. 18, 1977, 52/4938[U]
Int. Cl.[2] G05D *23/10*
U.S. Cl. 236—48 R **6 Claims**



1. A temperature responsive valve assembly comprising:
a body having a common port and first and second ports,
a thermostatic bimetal disk disposed within said body and

responsive to a variation in temperature to change the curvature thereof from a first position to a second position,

a first seat portion disposed within a first passage between said common port and said first port,

a second seat portion disposed within a second passage between said common port and said second port,

a valve member arranged between said first and second seat portions and engageable with said both seat portions,

a connecting means following the movement of said bimetal disk to thereby actuate said valve member between a first position wherein said valve member engages with said first seat portion to control said first passage, and a second position wherein said valve member engages with said second seat portion to control said second passage,

a seat member having said second seat portion thereon and being adjustably threaded with said body, said seat member having a projection receiving area, and

a plate member secured to said body and having a projection positioned within said receiving area of said seat member.

4,157,159

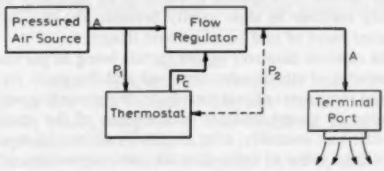
AUTOMATIC FLUID FLOW REGULATOR

Edward E. Modes, Deerfield, Ill., assignor to Mark Controls Corporation, Evanston, Ill.

Continuation-in-part of Ser. No. 416,202, Nov. 15, 1973, abandoned. This application Jul. 20, 1978, Ser. No. 926,436

Int. Cl.[2] F16K *31/12*; G05D *23/00*

U.S. Cl. 236—87 **6 Claims**



1. A pneumatic thermostat comprising means for reducing a variable pressure air supply to a substantially constant pressure air supply and means for generating from said constant pressure air supply an air pressure signal indicative of ambient temperature; said reducing means having means defining an air input port in communication with a first chamber, means defining a first air output port in communication with a second chamber, means for intermittently bleeding said first chamber to said second chamber so as to maintain a substantially constant pressure in said first chamber, and a restricted nozzle for continuously bleeding a substantially constant air supply from said first chamber; and said generating means having a housing which defines a third chamber in communication with said restricted nozzle, means for bleeding said third chamber to said second chamber at varying rates in response to changes in ambient temperature so as to produce a corresponding varying pressure within said third chamber, and means defining a second air output port in communication with said third chamber through which said air pressure signal may be transmitted from said thermostat, said signal corresponding to the pressure within said third chamber and indicative of the ambient temperature.

4,157,160

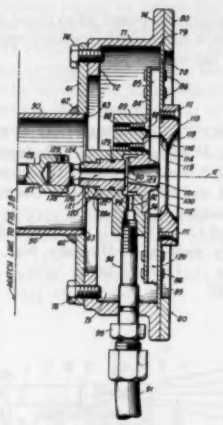
NOZZLE ASSEMBLY AND PROCESS OF DISPERSING AN AEROSOL

David W. Waldron, Valdosta, Ga., assignor to Lowndes Engineering Co., Inc., Valdosta, Ga.

Continuation-in-part of Ser. No. 618,739, Oct. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 419,925, Nov. 29, 1973, abandoned, and a continuation-in-part of Ser. No. 442,866, Feb. 15, 1974, abandoned, which is a continuation of Ser. No. 216,396, Jan. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 20,364, Mar. 17, 1970, Pat. No. 3,633,825. This application May 26, 1976, Ser. No. 690,148

Int. Cl.[2] A01N *17/02*; B05B *7/00*

U.S. Cl. 239—8 **15 Claims**



1. Process of producing an aerosol mixture of a liquid and air comprising:

(a) passing a first stream of air along a passageway defined by a conical wall which wall progressively diverges from a relatively small inlet to a relatively large outlet;

(b) introducing liquid circumferentially to said inlet so that increments of the liquid form a film which clings to said wall and is progressively moved along said wall toward said outlet, cross sectional increments of said film on said wall progressively becoming of larger diameter to thereby reduce the thickness of the film; and

(c) passing a separate stream of air adjacent to the outlet of said passageway to entrain the film of emerging liquid and for admixing with air emerging from said outlet, said second stream of air including a plurality of inwardly directed streams which move in arcuate paths so as to spiral outwardly adjacent said outlet.

4,157,161

WINDSHIELD WASHER

Peter Bauer, Germantown, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.

Filed Sep. 30, 1975, Ser. No. 618,252

Int. Cl.[2] B05B *1/08*

U.S. Cl. 239—11 **24 Claims**

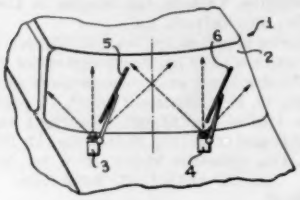
9. The method of wetting a vehicle window as part of a window washer and wiper arrangement, said method comprising the steps of:

pressurizing a quantity of wash liquid;

forming a jet of the pressurized wash liquid;

under the sole initiative of the pressure of said liquid, repetitively sweeping said jet in at least one dimension trans-

verse to the flow direction of said jet in an oscillatory manner; and



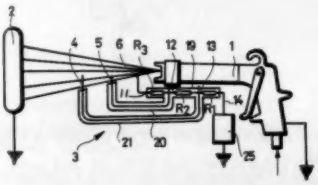
issuing the repetitively swept jet to cause it to break up into droplets which successively impinge upon said window in a generally fan-shaped pattern.

4,157,162

ELECTROSTATIC SPRAYING APPARATUS

György Benedek, 35 Ringló utca, 1221 Budapest; András Bese, 8 Andor utca, 1119 Budapest; József Domokos, 28 Hársfa utca, 1184 Budapest, and István Kovacs, 28 Garas utca, 1026 Budapest, all of Hungary

Filed Oct. 31, 1977, Ser. No. 846,715
Claims priority, application Hungary, Nov. 9, 1976, HA1028
Int. Cl.[2] B05B *5/02*
U.S. Cl. 239—707 **8 Claims**



1. An electrostatic spraying apparatus suitable for spraying a grounded workpiece with a water-based paint, comprising a grounded spraying device including a spraying outlet, means associated with said device for atomizing the paint, an insulating holder disposed about said device, ionizing needle electrode means arranged in said insulating holder and disposed externally of the spraying device and downstream of the spraying outlet relative to the direction of travel of the paint spray, high tension connections for connecting the electrode means to a source of high tension, wherein the improvement consists in that said electrode means comprises at least three electrodes disposed at differing distances from the spraying device along the direction of travel of the water-based paint spray towards the grounded workpiece to be coated and the consecutive electrodes are in use connected by means of the high tension connections to potentials that increase with their respective distance from the spraying outlet.

4,157,163

REVERSIBLE AIRLESS SPRAY NOZZLE

Joseph G. Pinto, Salisbury, Md., and Christopher Lawlor, North Ridgeville, Ohio, assignors to The Sherwin-Williams Company, Cleveland, Ohio

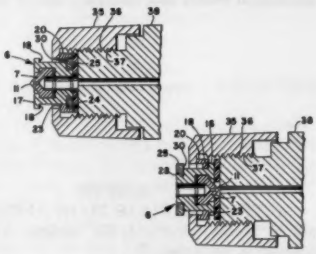
Filed Nov. 11, 1977, Ser. No. 850,757
Int. Cl.[2] B05B *15/02*
U.S. Cl. 239—119 **4 Claims**

1. A spray gun nozzle unit assembly adapted to reversible longitudinal mounting within the confined space between the downstream end of an internally threaded retainer ring of an airless spray gun and the upstream externally threaded nozzle of a spray gun barrel which comprises:

(a) an axially bored cylindrical body member, the downstream paint dispersing end of which bore has permanently and centrally mounted in said bore an airless spray orifice;

(b) the opposite end of said axially bored body member terminating in a body section of reduced diameter in both the internal continuous bore and its external body diameter, said external end section adapted to accomodate a centrally bored flange element, which, in final assembly, is permanently positioned and held about said end section, the exterior face of said flange element in assembly being substantially flush with the exterior end body face;

(c) the spray orifice containing end of said body member likewise terminating in a radially outwardly extending annular boss of larger diameter than said body diameter, but of substantially the same external diameter as the said flange element, the vertical faces of said flange element and said boss being flat, separate from and parallel to each other and normal to the axis of said cylindrical body member;



(d) the internal flat faces of said annular boss at the spray orifice end and said internal flat face of said flange at the opposite end of said body member defining the length of the uniform external diameter cylindrical section and the limitation of axial displacement of a female ferrule when said ferrule is in medial position of its assembly on said body member to slide axially between the inwardly directed faces of said boss and said flange;

(e) the external diameter of said ferrule being larger than the diameter of said annular boss and said flange;

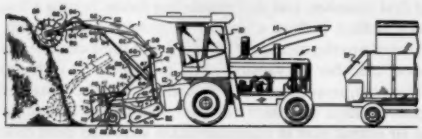
(f) axial movement of said ferrule or ring providing accomodation to permit sealable compression of the spray gun nozzle unit assembly, after assembly, within the described confined space as defined, in alternative positions of paint spraying or spray tip cleaning, into a hydraulic pressure tight engagement within the spray gun head space upon operative assembly of said unit elements.

4,157,164

FORAGE HANDLER

Arnold E. Helm, and Lennis D. Helm, both of R.R. 1, Linn, Kans. 66953

Filed Jan. 27, 1978, Ser. No. 872,757
Int. Cl.[2] B02C *18/22*; E21C *35/00*
U.S. Cl. 241—101.7 **7 Claims**



1. A mobile handler for retrieving and processing stacked, unchopped forage, and adapted for attachment to a mobile forage gathering device, said handler comprising:

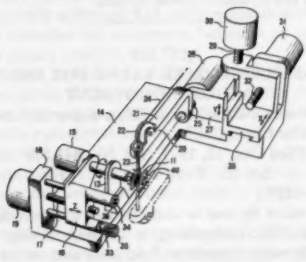
(a) a rotary head having a plurality of rigid, blunt tines protruding radially thereof for dislodging unchopped forage from stacks thereof;
(b) a first support frame having said rotary head rotatably mounted in a first end thereof; said first support frame having a second end thereof shaped for pivotally connecting said frame with said forage gathering device, whereby said rotary head is positioned substantially transverse to and forward of said forage gathering device;
(c) first motor means operably connected with and rotating said rotary head;
(d) second motor means operably connected with and selectively pivoting said first support means with respect to said forage gathering device, and selectively swinging said rotary head into a plurality of vertical positions;
(e) a rotary beater having a plurality of rigid, blunt teeth projecting radially thereof for breaking up large aggregations of the unchopped forage which are dislodged from the stack by the rotary head;
(f) a second support frame having said rotary beater rotatably mounted in a first end thereof; said second support frame having a second end thereof shaped for connection with said forage gathering device, whereby said rotary beater is disposed substantially transverse and forward of said forage gathering device, and said rotary beater is normally disposed below and rearward of said rotary head; and
(g) third motor means operably connected with and rotating said rotary beater; and
(h) cutter means for chopping up the forage; said cutter means including rotary pick up tines which pick up separated, unchopped forage from the ground and convey the same to a chopper portion of said cutter means; said cutter means being connected with said forage gathering device, and positioned directly rearwardly and in-line with said rotary beater, whereby unchopped forage is in sequence, dislodged from the stacks by said rotary head; directed under gravitational forces into said rotary beater for flailing the unchopped forage to break up the large aggregations thereof and urge the separated forage into the cutter; picked up from the ground by said rotary tines; and cut into small segments by the chopper portion of the cutter means for transportation into the forage gathering device.

4,157,165

COIL WINDING AND TERMINATING MACHINE

Richard L. Bierman, Pelham, N.H., and Hazen Curtis, III, Andover, Mass., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 686,460, May 14, 1976, abandoned. This application Dec. 7, 1977, Ser. No. 858,388
Int. Cl.[2] H01F *41/06, 41/10*
U.S. Cl. 242—7.09 **4 Claims**



1. An apparatus for winding and terminating an electrical coil by winding wire into a coil on a bobbin having projecting terminals and by wrapping the wire ends of the coil about the terminals, said apparatus comprising:

a. a rotatable spindle adapted to support a bobbin mounted on the end thereof with its axis essentially coincident with the axis of rotation of the spindle, said bobbin supporting electrical terminals projecting therefrom;

b. a wire guide for feeding wire to said bobbin and terminals; means for extending said wire guide away from its support means so as to have a free end; a wire delivery opening adjacent said free end through which the wire is fed to the bobbin or terminals; a rotatable member by means of which the wire guide can be rotated about an axis essentially perpendicular to the axis of the spindle; motor means for rotating said rotatable member so that the wire can be fed perpendicular to the spindle axis during the winding of the bobbin and can be fed perpendicular or parallel to the spindle axis during the wrapping of the wire about the terminals; and

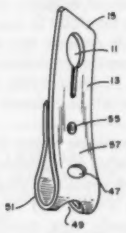
c. supporting carriage means by which the wire guide and spindle can be moved in three mutually perpendicular directions with respect to one another and motor means for moving said carriage means so that the wire guide and a terminal can be moved into juxtaposition and an orbiting motion imparted to the wire guide so as to wrap the terminal with wire.

4,157,166

EYEGLASSES HOLDER

Walter G. Voelker, 1524 N. Main St., Walnut Creek, Calif. 94596

Filed Jul. 18, 1977, Ser. No. 816,344
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—317 **1 Claim**



1. An improved holder for eyeglasses or the like comprising an elongated band wherein the lower end of the elongated band is folded upwardly and secured to the center portion of said band forming a loop,

attachment means disposed at the upper end of the band for permitting the band to be attached to a fixed object and to vertically depend therefrom,

a pair of supporting means disposed proximate the looped end of the band, the first of said supporting means comprising a first opening disposed on a flat vertical side of the looped portion of said elongated band such that it can encircle one of the temple pieces of a pair of eyeglasses at the hinged end thereof proximate the frame containing the lenses of the eyeglasses, and the second of said supporting means comprising a generally circular second opening disposed on the elongated band proximate the fold line of said looped portion thereof such that it can encircle the temple piece of said eyeglasses at a position between the free end and the hinged end thereof,

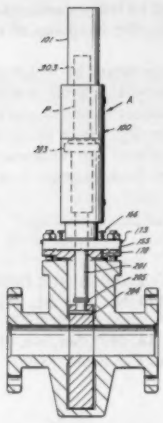
said first and second supporting means being permanently disposed in a straight alignment relative to each other, such that the free end of the temple piece of the eyeglasses may be downwardly inserted through the first and then second supporting means whereby said temple piece can in a single downward movement be forced to depend vertically from said elongated band and said eyeglasses when folded can be suspended securely from said band.

4,157,167

VALVE ACTUATOR AND PILOT ASSEMBLY THEREFOR

Neil H. Akkerman, New Orleans, La., assignor to Baker International Corporation, Orange, Calif.

Filed May 6, 1977, Ser. No. 794,571
Int. Cl. F16k *31/124*
U.S. Cl. 251—28 **54 Claims**



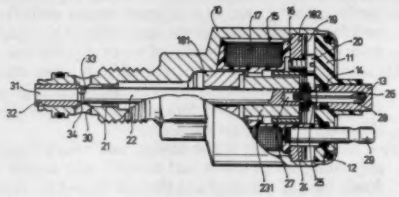
20. In a flow line actuator respondable to a source of fluid pressure for manipulation of operative means of a valve between open and closed position, a pilot assembly comprising: a housing; pilot means within said housing having valve seat means thereon; normally free traveling spherical members immediate said pilot means defining valve head means and sealingly engagable onto said pilot means and wipable thereoff to selectively open and close said pilot means to control fluid flow therethrough, said pilot means comprising first, second and third pilot members, said first pilot member being selectively communicable with said source of fluid pressure, one of said second and third pilot members having one of said spherical members in sealing engaged position on its seat and the other of said second and third pilot members having said spherical members in disengaged position with respect to its seat when said first pilot member is in fluid communication with the source fluid pressure to permit said source fluid pressure to be transmitted through said pilot means and act within said actuator to move said operative means to one of open and closed position, said second and said third pilot members each having its respective spherical members in disengaged position with respect to its seat when said first pilot member has one of said spherical members in sealing engaged position on its seat whereby fluid pressure within said actuator is transmitted within said pilot means to act within said actuator to move said operative means to one of open and closed position, one of said second and third pilot members having one of said spherical members in sealing engaged position on its seat when said first pilot member has its respective spherical members in disengaged position with respect to its seat to isolate fluid pressure within said actuator from said source of fluid pressure and permit fluid pressure within said actuator to be transmitted through said pilot means and to act within said actuator to move said operative means to one of open and closed position.

4,157,168

ELECTROMAGNETICALLY OPERATED VALVE STRUCTURE

Walter Schlagmüller, Schwieberdingen, and Rudolf Babitzka, Kirchberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 21, 1977, Ser. No. 853,265
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658969
Int. Cl.[2] F16K *31/06, 47/08*
U.S. Cl. 251—52 **19 Claims**



1. Electromagnetically operated valve structure having
a hollow housing (**10, 11**) defining a chamber therein;
a solenoid coil (**15**) in said chamber;
a reciprocating plunger (**22**) in said chamber;
an armature (**231, 232**) carried by said plunger (**22**) and in magnetically coupled relation to said solenoid coil for reciprocation of said plunger in dependence on energization of said coil;
a slide bearing (**21**) in said housing, guiding and supporting said plunger (**22**) for reciprocation, and having an axial dimension which is short with respect to the length of the plunger, and located adjacent one end thereof;
a membrane (**19**) secured in said housing and extending transversely of said plunger (**22**) and supporting said plunger adjacent the other end thereof;
fluid inlet means (**31, 32**) and fluid outlet means (**33**) formed in said housing;
and a valve seat (**34**) between said fluid inlet means and said fluid outlet means, the plunger (**22**) extending towards the valve seat and controlling fluid communication between said inlet and outlet means,
and comprising, in accordance with the invention,
a damping piston (**25**) - cylinder (**27**) system (**25, 27**) operatively associated with said plunger (**22**) and said housing and including a blind bore formed in said plunger extending in the direction of reciprocating movement thereof and forming said cylinder, and a piston (**27**) secured to said housing and fitting into said bore, with slight clearance;
and a damping fluid in at least the portion of the housing adjacent the cylinder-piston system.

4,157,169

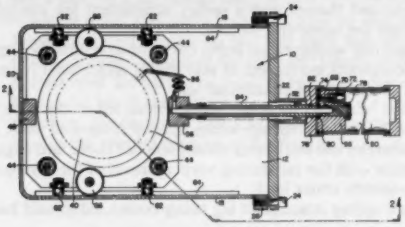
FLUID OPERATED GATE VALVE FOR USE WITH VACUUM EQUIPMENT

Arthur E. Norman, Northridge, Calif., assignor to Torr Vacuum Products, Van Nuys, Calif.

Filed Oct. 12, 1977, Ser. No. 841,570
Int. Cl.[2] F16K *3/03, 31/143*
U.S. Cl. 251—195 **9 Claims**

1. A gate valve for use in conjunction with vacuum equipment, and the like, comprising: a housing having a pair of opposite walls with respective fluid inlet and outlet openings therein providing a conduit through the valve when the valve is open; a pair of valve seats mounted to surround respective ones of said openings; a gate assembly including a pair of gates positioned adjacent to one another and movable away from one another to seat against said valve seats; a pressure chamber means formed between the gates, an actuator including a cylinder mounted on said housing, a piston mounted in said cylinder and movable therein, and an actuator rod coupled to said

piston and coupled to said gate assembly for reciprocally moving said gate assembly in a direction parallel to said opposite wall of said housing between a first position adjacent to said openings and a second position displaced from said openings as said piston is moved in said cylinder, and means for introducing pressurized fluid into said cylinder to move said piston



therein; and valve means coupled to said piston for introducing a pressurized fluid into said pressure chamber means when said piston reaches a predetermined position in said cylinder and when said gate assembly is in said first position to cause said gates to move away from one another and to engage and seal with respective ones of said seats.

4,157,170

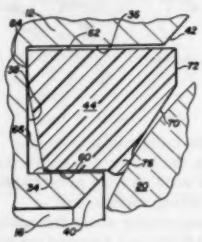
GROOVE MOUNTED RESILIENT VALVE SEAT HAVING DEFORMABLE LIP

William E. McClurg, Stafford, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 693,467, Jun. 7, 1976, abandoned. This application Dec. 27, 1977, Ser. No. 864,407

Int. Cl.[2] F16K *5/06*

U.S. Cl. 251—315 **1 Claim**



1. A ball valve comprising:

(a) a valve body having inlet and outlet passages and a valve chamber therebetween;

(b) a generally spherical ball valve member mounted in said valve chamber for movement between an open position and a closed position;

(c) upstream and downstream grooves of annular shape formed about the respective inlet and outlet passages, each groove opening to said valve chamber and defining substantially cylindrical inner and outer sides concentric with one another;

(d) a substantially flat bottom of each groove extending between said inner and outer sides in perpendicular relation thereto;

(e) upstream and downstream annular seat members in the respective upstream and downstream grooves for contacting the valve member, each seat member being resilient and having substantially cylindrical inner and outer sides concentric with one another and spaced from the corresponding sides of the associated groove when the seat member is in an uncompressed condition;

(f) a bottom of each seat member in the form of a substantially flat outer portion normally sealed against the bottom of the associated groove and a contiguous inclined portion intersecting said inner side of the seat member and normally spaced from the groove bottom;

(g) a substantially frusto-conical surface of each seat member facing the valve member;

(h) an annular lip of each seat member formed integrally therewith between said frusto-conical surface and inner side on a minimum diameter portion of the seat member and at a location spaced away from said inclined portion of the bottom of the seat member, each lip normally sealing against the valve member and being spaced closely from the inner side of the corresponding groove so that said inner side of each seat member is restrained by the inner side of the corresponding groove at a location closely adjacent said lip;

(i) said downstream seat member deforming when loaded in compression such that the sides thereof contact the corresponding sides of the downstream groove to thereby limit deformation of the downstream seat member, said frusto-conical surface of the downstream seat member sealing against the valve member when same is closed and subjected to line pressure forcing it toward the downstream seat member;

(j) said lip of the upstream seat member sealing against the valve member and said flat outer bottom portion of the upstream seat member sealing against the bottom of the upstream groove to provide the only contact of said upstream seat member with said valve body and said valve member when the latter is closed and subjected to line pressure; and

(k) said upstream seat member presenting a greater surface area exposed to said valve chamber than to said inlet passage so that fluid pressure in said valve chamber in excess of fluid pressure in said inlet passage effects pivoting of said upstream seat member about its flat outer bottom portion in a direction to release the seal between its annular lip and said valve member, whereby the fluid in said valve chamber bleeds into the inlet passage.

4,157,171

TENSIONING DEVICE FOR CHAINS, WIRE ROPES ETC.

Kjell Hasselås, Handen, Sweden, assignor to Seasafe Transport AB, Stockholm, Sweden

Continuation of Ser. No. 735,599, Oct. 26, 1976, abandoned. This application Aug. 17, 1977, Ser. No. 825,412

Int. Cl.[2] B66F *3/10*

U.S. Cl. 254—67 **11 Claims**

1. A tensioning device for chains and the like comprising an elongated hollow casing closed at each end and having a longitudinal slot formed in the wall thereof, a first hook member secured fixedly at one end of said casing and extending radially therefrom, a slidable body located in said casing, a second hook member integral with said body extending outwardly of said slot in opposition to said first hook member, screw means threadedly extending through said slidable body, said screw

means extending outwardly of the end of said casing opposite said first hook member and having means for engagement with a power drive means, and a slidable sleeve surrounding said casing and integrally attached to said second hook member thereby resisting torque reaction between said casing and said slidable body.

4,157,172

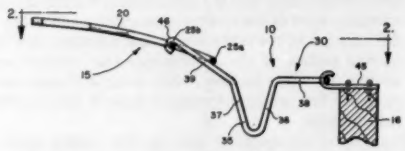
SEAT BASE RAIL CONNECTOR AND ASSEMBLY

Lawton H. Crosby, Lake Bluff, Ill., assignor to Morley Furniture Spring Corporation, Chicago, Ill.

Filed Dec. 30, 1977, Ser. No. 865,967

Int. Cl.[2] F16F *3/02*

U.S. Cl. 267—110 **4 Claims**



1. In a furniture seat base including a frame having a front rail and a back rail and a plurality of sinuous spring band assemblies disposed between said rails, the improvement in a sinuous spring band assembly, comprising:

a. a normally arced sinuous spring band comprising a plurality of generally linear wire segments interconnected by a plurality of generally semi-circular wire segments connected to the front rail and extending into close proximity with the back rail,

b. a rail connector connecting said band to the back rail,

c. said rail connector having a V-shaped body with rail side leg means and spring side leg means directly joined at an apex at corresponding one ends and diverging to opposite free ends,

d. rail attachment leg means joined to the free end of said rail side leg means and pivotally connected to the back rail,

e. spring attachment leg means joined to the free end of said spring side leg means and connected to the back end of said sinuous spring band,

f. said spring attachment leg means underlying the linear wire segment at the back end of said band and overlying a linear wire segment inwardly of the back end of said band so as to exert a torque effect tending to flatten the arc of said normally arced band.

4,157,173

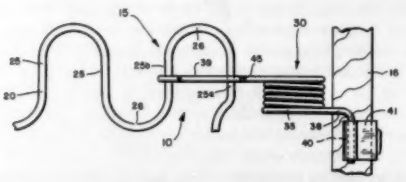
SEAT BASE RAIL CONNECTOR AND ASSEMBLY

Lawton H. Crosby, Lake Bluff, Ill., assignor to Morley Furniture Spring Corporation, Chicago, Ill.

Filed Dec. 30, 1977, Ser. No. 865,966

Int. Cl.[2] F16F *3/02*

U.S. Cl. 267—110 **3 Claims**



1. In a furniture seat base including a frame having a front rail and a back rail and a plurality of sinuous spring band assemblies disposed between said rails, the improvement in a sinuous spring band assembly, comprising:

a. a normally arced sinuous spring band comprising a plurality of generally linear wire segments interconnected by a plurality of generally semi-circular wire segments connected to the front rail and extending into close proximity with the back rail, and

b. a rail connector connecting said band to the back rail,

c. said rail connector including coil spring means for storing energy and having a rail attachment leg extending from one end thereof and a spring attachment leg extending from the other end thereof,

d. said coil spring means being effective to resiliently oppose downward movement of said spring attachment leg relative to said rail attachment leg,

e. said rail attachment leg being connected to the back rail with said coil spring means spaced from said back rail whereby the coil spring means will not come into engagement with the rail during vertical travel of the seat spring assembly under load,

f. said spring attachment leg being connected to said band.

4,157,174

COLLAPSIBLE WORKBENCHES

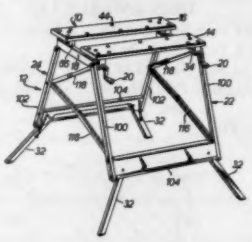
Ronald P. Hickman, and Brian A. Luff, both of Trinity, Jersey, Channel Islands, assignors to Inventec International Limited, Channel Islands

Filed May 4, 1977, Ser. No. 793,549

Claims priority, application United Kingdom, May 5, 1976, 18293/76; Oct. 21, 1976, 43740/76; Mar. 11, 1977, 10425/77

Int. Cl.[2] B25B *1/10*

U.S. Cl. 269—139 **45 Claims**



1. A workbench, comprising:

a top structure, including front and rear elongate beams having upper surfaces lying in substantially the same plane to form a working surface; and

a collapsible supporting structure which includes a first generally flat frame and a second generally flat frame, said frames being pivotally connected to the top structure for swinging movement in the front-to-rear direction about first and second pivot axes, respectively, between

(a) a collapsed position in which the frames and the top structure lie close together, with the first frame lying on the same side of the second frame as does the top structure, and

(b) an erected position in which the frames support the top structure above the ground, with the frames diverging downwardly from one another in the front-to-rear direction to provide a supporting area greater than the area of the working surface;

said supporting structure also including a front-to-rear extending link at each end thereof, each of said links being connected at its ends to said frames for pivoting relative thereto about third and fourth pivot axes, respectively; said third and fourth axes lying at a lower level than either of the first and second pivot axes when the supporting structure is in the erected position;

said third pivot axis lying at a level which is sufficiently below the level of the fourth pivot axis that the sum of the distances between the first and second pivot axes and between the first and third pivot axes is substantially equal to the sum of the distances between the second and fourth pivot axes and the third and fourth pivot axes, so that, in

the collapsed position of the supporting structure, both the first and fourth pivot axes lie close to the plane passing through the second and third pivot axes;

at least said first frame including a pair of legs which are connected, at the ends thereof remote from the second pivot axis, by a horizontal bar;

said fourth pivot axis being located higher on said second frame than said horizontal bar and each link deviating from a straight line joining the third and fourth pivot axes, at least over the part of its length which lies adjacent the horizontal bar in the collapsed position of the supporting structure, the deviation being an upward deviation when seen in the erected position of the frames.

4,157,175

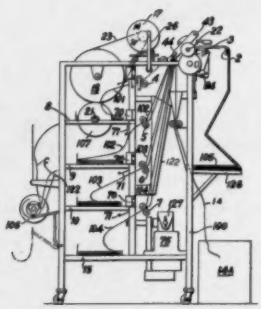
DELEAVING AND TRIMMING MACHINE WITH IMPROVED ARRANGEMENT FOR ADJUSTING SPEED AND TORQUE OF ROLL

Lawrence B. Patterson, R.D. #3, Cochranton, Pa. 16314

Filed Jul. 27, 1976, Ser. No. 709,115

Int. Cl.² B65H *41/00*

U.S. Cl. 270—52.5 **21 Claims**



1. A machine for separating folded sheets of a continuous web of paper and made up of layers of paper and for refolding said paper comprising,

means to support a stack made up of first paper layers and a second paper layer disposed between said first paper layers,

positive means to drive said web,

spaced aligned pairs of rolls receiving at least two said first layers of paper and one said second layer of paper therebetween,

means driving said rolls,

a single reel supported on said machine in spaced relation to said rolls for winding said second layer thereon, and

means to reduce the speed of rotation on said reel relative to the speed of said rolls as the diameter of said second paper layers wrapped on said reel increases,

said reel comprising,

spaced rods extending axially of said reel,

said rods having spikes supported at intermediate parts thereon at right angles to the axis of said rods, and

spring means urging said spikes to remain in said position at right angles to said rod whereby web materials supported on said rods may be held by said spikes and wound around said rods.

4,157,176

APPARATUS FOR PRECISELY STACKING TEXTILE PIECES OF SHEETLIKE FORM

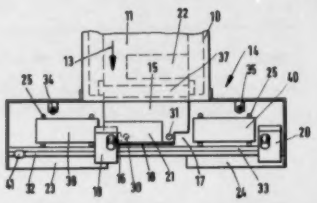
Albrecht Kaiser, Vlotho-Uffeln, and Rolf Heine, Rinteln, both of Fed. Rep. of Germany, assignors to Herbert Kannegiesser Kommanditgesellschaft, Vlotho, Fed. Rep. of Germany

Filed Sep. 13, 1977, Ser. No. 832,770

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1976, 2642265

Int. Cl.² B65H *29/28, 29/60*

U.S. Cl. 271—64 **7 Claims**



1. In an apparatus for cementing textile pieces of sheetlike form having a feeding end and an in-line, remote discharging end, and having a continuously running transport device for discharging cemented textile pieces in serial fashion at said discharging end, the improvement comprising a stacking device for stacking said textile pieces of sheetlike form as discharged from the transport device, said stacking device comprising:

a downwardly inclined slip plate located at the discharge end of the transport device and receiving textile pieces which move along the surface of the slip plate,

a locating stop at the end of the slip plate remote from said transport device,

apertures on the sides of said slip plate at the end carrying said locating stop,

a pair of clamping devices movable at right angles to the direction of textile piece movement on said slip plate between positions aligned with said slip plate apertures and positions laterally displaced therefrom, and comprising means for grasping portions of said textile pieces lying in the area of the aperture and for conveying said textile pieces to stacking tables to the right and left of said slip plate, said stacking tables projecting laterally beyond said continuously running transport device; whereby, articles stacked thereon are directly visible from said feeding end of the apparatus remote from the discharging end.

4,157,177

APPARATUS FOR CONVERTING A STREAM OF PARTLY OVERLAPPING SHEETS INTO A STACK

Hubert Strecker, Jugenheim, Fed. Rep. of Germany, assignor to Dr. Otto C. Strecker KG. and Bruderhaus Machinen GmbH, both of Reutlingen, Fed. Rep. of Germany

Continuation of Ser. No. 747,508, Dec. 6, 1976, abandoned. This application Apr. 6, 1978, Ser. No. 893,832

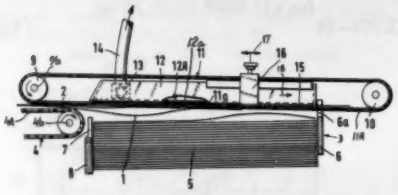
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1975, 2555531

Int. Cl.² B65H *29/32*

U.S. Cl. 271—197 **2 Claims**

1. Apparatus for converting a stream of flexible sheets, particularly paper sheets, wherein the trailing portion of each preceding sheet is overlapped by the leader of the next-following sheet, into a stack of fully overlapping sheets, comprising a support for the stack of sheets, said support including a member against which the leaders of the sheets in the stack abut; at least one endless perforated conveyor having an elongated lower reach above said support; means for driving said conveyor to thereby move said lower reach in the direction from the one toward the other end thereof; a suction chamber dis-

posed above said lower reach and having a foraminous bottom wall adjacent said lower reach; means for feeding the stream to said one end of said lower reach whereby the underside of said lower reach attracts the leaders of successive sheets of the stream and advances the thus attracted sheets toward a position of register with said support; and means for varying the effective length of that portion of said lower reach which attracts the leaders of successive sheets to said underside



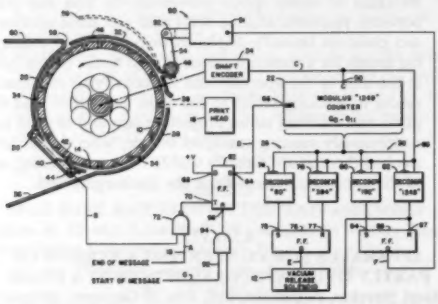
thereof, including a non-permeable sealing device disposed between said bottom wall and said lower reach and abutting against said bottom wall to seal the adjacent portion of said lower reach from the interior of said suction chamber, said sealing device extending beyond said member of said support toward said one end of said lower reach to overlie a portion of the stack adjacent to said member so that the leaders of successive sheets are free to become separated from said lower reach before such leaders reach said member of said support.

4,157,178

METHOD AND APPARATUS FOR REMOVING PAPER FROM A ROTATING DRUM

Gary B. Ollendick, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Mar. 1, 1976, Ser. No. 662,780
Int. Cl.[2] B65H *5/12*
U.S. Cl. 271—276 **6 Claims**



1. An apparatus for discharging a sheet of paper from a rotating apertured drum platen, the apparatus including means for maintaining a vacuum within the drum so that the paper is maintained on the drum by vacuum pressure and a guide shroud disposed about the drum, the improvement comprising:

means for defining a paper discharge opening in the shroud,

means for interrupting said vacuum means so as to interrupt the vacuum within the drum thereby allowing the paper to come to rest within the shroud;

means for reapplying the vacuum to the rotating drum whereby the rotating drum boosts the paper from the shroud through the discharge opening; and

said drum being coupled to a shaft encoder generating a pulse train related to the rotation of the drum and wherein said vacuum interrupting means includes a counter driven by said pulse train and means for decoding at least one first selected state of said counter, said selected counter state determining when said interrupting means interrupts the vacuum pressure within the drum.

5. A method for removing a sheet of paper maintained on a rotating drum by a vacuum pressure created within the drum, the drum being substantially surrounded by a shroud defining a discharge opening comprising the steps of:

releasing the vacuum created within the drum to allow the paper to come to rest within the shroud; and

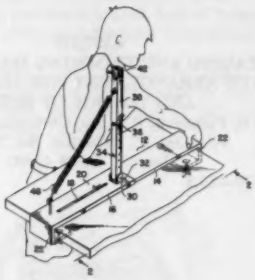
reapplying the vacuum to the rotating drum whereby the rotating drum boosts the paper out of the shroud through the discharge opening.

4,157,179

ARM EXERCISING DEVICE

Edward Ecklor, Jr., 211 S. Sixth Ave., Marshalltown, Iowa 50158

Filed Aug. 10, 1977, Ser. No. 823,531
Int. Cl.[2] A63B *23/00*
U.S. Cl. 272—67 **3 Claims**



1. An exercising device comprising a supporting base consisting of two elongated, slidably adjustable telescoping parts, each part having an outer end formed in a table-engaging clamp; an upstanding lever pivoted directly to a first part of the parts of said base; a handle mounted to said lever; and tensioning means stretched between said lever and said first part of the said base to resist a force applied by a user to pivoting of the lever.

4,157,180

ADJUSTABLE SUPPORT FOR A HIGH JUMP BAR

Marcel Favre, 119 rue des Moulins, 1400 Yverdon, Switzerland

Continuation of Ser. No. 674,275, Apr. 6, 1976, abandoned. This application Dec. 13, 1977, Ser. No. 860,239
Claims priority, application Switzerland, Apr. 9, 1975, 4690/75
Int. Cl.[2] A63B *1/06*
U.S. Cl. 272—103 **6 Claims**

1. An adjustable support adapted to be mounted on a jump post for supporting a jumping bar comprising:

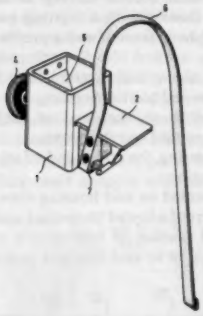
a tubular support member slidably mounted on said jump post, said tubular support member including a horizontally disposed platform for supporting an end of said jumping bar;

a locking means connected to said tubular support member for securing said member at a selected height on said jump post; and

a flexible and elastic arch-shaped member mounted at one end to said support member and forming a loop extending from below said platform on one side thereof above and around the horizontal surface of said platform in spaced relationship with respect thereto, the other end of said arch-shaped member extending substantially vertically from above to below said platform in spaced relationship with respect to said platform,

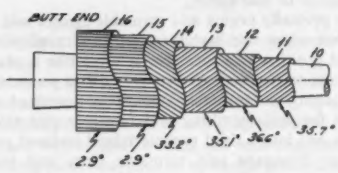
the space between said arch-shaped member and said hori-

zontal platform being at least greater than the cross-sectional area of said jumping bar to thereby permit said



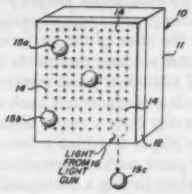
jumping bar to be forced from said platform and directed toward a location proximate the base of said jump post.

4,157,181
GRAPHITE FIBER TAPERED SHAFTS
Andrew M. Cecka, Thousand Oaks, Calif., assignor to Fansteel Inc., North Chicago, Ill.
Continuation of Ser. No. 684,181, May 7, 1976, abandoned. This application Jun. 12, 1978, Ser. No. 914,921
Int. Cl.[2] A63B *53/10, 53/12*
U.S. Cl. 273—80 R **1 Claim**



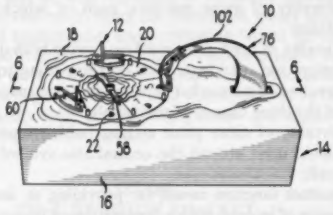
1. An improved tapered tubular golf club shaft having a butt end and tip end and consisting essentially of a series of helically wound layers of graphite fibers bonded with a thermosetting epoxy resin material, said improved shaft comprising a plurality of graphite fiber tows in each layer extending continuously for the entire length of the hollow tubular shaft, the wall thickness of the shaft increasing curvilinearly from the butt to the tip end in a smooth curve from about 0.045 inches to about 0.095 inches, with about two-thirds of the layers forming the inner layers having an orientation of the fiber tows in the range of about 13° to 45° with respect to the longitudinal axis of the tubular shaft, of which there is an even number of such layers and in which the fiber tows in alternate layers are wrapped in opposing clockwise or counterclockwise directions, or counterclockwise and clockwise directions, the angle of the fiber tows in the inner layers decreasing in the specified range from the butt end to the tip end, and about one-third of the layers forming the outer layers having an orientation of the fiber tows of up to 18 degrees with respect to the longitudinal axis of the tubular shaft, the angle of the fiber tows in the outer layers increasing in the specified range from the butt end to the tip end, with such outer layers wrapped in either the clockwise or counterclockwise direction, in which the orientation of the fiber tows varies continuously along the tube length as a result of the taper of shaft in combination with a continuous change in rate of wrapping of the tows in at least either two of the adjacent inner layers having the opposed wrapping direction, 13 to 45 degree fiber orientations or in the outer layers with up to 18 degree fiber orientation.

4,157,182
FALLING TARGET LIGHT GAME AND TARGET PRACTICE DEVICE
Alfred B. Levine, 2924 Terrace Dr., Chevy Chase, Md. 20015
Filed Jan. 10, 1977, Ser. No. 758,153
Int. Cl.[2] A63B *9/02*; F41J *5/00*
U.S. Cl. 273—101.1 **7 Claims**



1. A light energized target game or practice device having a light generating projector, at least one lightweight target object having a portion that is non-conductive and capable of passing light, and a target support member releasably carrying said target object that is released when the target is energized by light from the projector, said target support member being electrostatically chargeable to releasably retain said target object, and light sensitive means associated with said target support member and target object to release said target object in responsive to the reception of light at the region of the target object from said projector by dissipating the electrostatic charge.

4,157,183
GAME APPARATUS
Burton C. Meyer, Downers Grove, and Alan A. Hicks, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Jul. 18, 1977, Ser. No. 816,379
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—243 **17 Claims**



1. A game apparatus, comprising:
a base;
a platform movably mounted on the base;
at least one playing piece adapted to be removably mounted on the platform;
means for retrieving a playing piece from the platform; and
trip means for actuating said retrieval means to retrieve a playing piece from said platform, said trip means being automatically actuated in response to a predetermined movement of said platform.

4,157,184
GAME APPARATUS
Richard H. Recard, Jr., P.O. Box 34529, Bethesda, Md. 20034
Filed Aug. 25, 1977, Ser. No. 827,709
Int. Cl.[2] A63F *3/04*
U.S. Cl. 273—253 **12 Claims**

1. A game apparatus for use by a plurality of players and comprising:

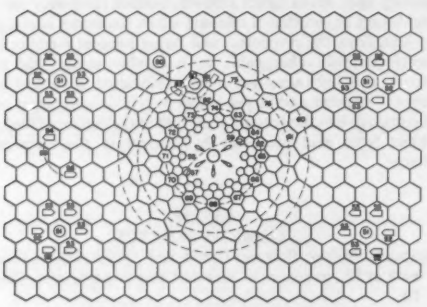
a flat game board essentially divided into hexagonal shaped cells arranged around a central symbol representing a star and further including a plurality of pentagonal shaped cells located around said central symbol;

a plurality of game markers representing three classes of spacecraft, each of said game markers having both two distinguishing colors and additional markings, wherein one color on each game marker represents the player to which it belongs and a second color on each game marker represents the class of the spacecraft it represents while the additional marking represents the spacecraft number;

a plurality of additional game markers also representing an additional class of spacecraft, each of said additional game markers having only a single distinguishing color representing the player to which it belongs;

a plurality of game markers representing space stations, each of said markers having a distinguishing color representing the player to which it belongs;

a velocity marker means having numbers used to represent the simulated velocities of each spacecraft of the three classes of spacecraft and two distinguishing colors used to



represent the respective completion or non-completion of a specified orbit of a specified spacecraft;

a plurality of game markers, each of which represent a planet;

a plurality of orbit game markers having both distinguishing colors and markings, each corresponding to a single respective game marker representing one spacecraft of one of the three classes of spacecraft;

a plurality of score game markers which represent a completed orbit around the central star symbol by a spacecraft;

a random function means for providing an integer from a range of integers with a predetermined frequency distribution;

said players taking turns in moving their spacecraft game pieces from hexagon shaped cell to hexagon shaped cell with the number of cells traversed in each player's turn equal to the number specified by said velocity marker means;

said players moving some of said planet game markers two hexagon cells with each turn so as to trace a circular path around said star.

4,157,185

AUTOMATICALLY RESETTABLE TOY PHONOGRAPH ASSEMBLY

Richard J. Mayer, 790 Smith Rd., Parsippany, N.J. 07054

Filed Jun. 9, 1978, Ser. No. 914,038
Int. Cl.[2] G11B *17/06;* A63H *3/33*
U.S. Cl. 274—1 A **9 Claims**

1. An automatically resettable phonograph assembly comprising:

a housing;

a rotatable turntable mounted in said housing for rotation in a first position;

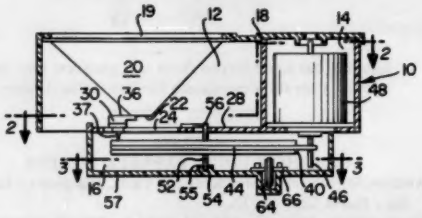
a phonograph record mounted upon said turntable for rotation therewith, said record having at least one spiral groove formed therein with a starting position substantially at the periphery thereof and a predetermined terminal position;

a tonearm located above said turntable and being pivotally connected at one end to said housing;

a stylus connected to another end of said tonearm and adapted to engage said spiral groove;

spring means for biasing the stylus end of said tonearm into said starting position;

a speaker cone mounted on said housing above said tonearm with one end thereof adapted to contact said tonearm over a predetermined portion of said record extending from said starting position to said terminal position;



a motor having a drive shaft;

an endless belt entrained about said drive shaft and said turntable for rotating said turntable in response to the energization of said motor;

means for pivotally urging said turntable against said stylus such that when said stylus reaches said predetermined terminal position said turntable is tilted into a predetermined second position relative to said first position; and

means engaging said turntable in said predetermined second position for initially tilting said turntable past said first position and into a third predetermined inclined position so as to disengage said turntable from said tonearm thereby automatically returning said tonearm to said starting position and then repositioning said turntable into said first position.

4,157,186

HEAVY DUTY ROTATING BLOWOUT PREVENTOR

Edwin G. Murray, 4208 Waverly, and Donnie L. Murray, 4207 Lynnbrook, both of Odessa, Tex. 79762

Filed Oct. 17, 1977, Ser. No. 842,694
Int. Cl.[2] F16J *15/50*
U.S. Cl. 277—31 **8 Claims**

1. A rotating blowout preventor having a main support housing (12) by which the rotating blowout preventor can be attached to the top of a stack of tools which are attached to a borehole casing; an axial passageway formed through said support housing;

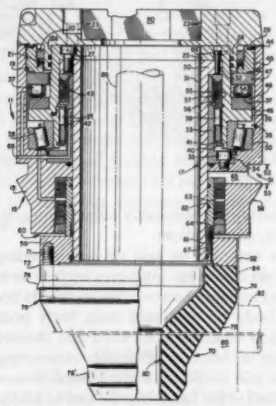
a removable, rotating seal assembly (11), means forming a central, longitudinal passageway (30) through said seal assembly for receiving a rotating drive member (86) therethrough; means forming a lateral outlet flow passageway (82) in said support housing through which drilling mud can flow from said axial passageway;

said removable, rotating seal assembly having a lower marginal end portion thereof (18) adapted to be removably received within said axial passageway, means (15) affixing the lower marginal end of said seal assembly to the upper marginal end of said support housing;

said seal assembly includes a resilient stripper seal (70), a fixed outer skirt (16), and a rotatable inner skirt (31) concentrically arranged within said outer skirt; means (33, 46) forming a bearing and seal chamber (36) between said

outer fixed skirt and said inner rotatable skirt; means (59) attaching said resilient stripper seal to the lower end of said inner skirt;

said bearing and seal chamber is closed at the bottom (51) and is upwardly opening with a seal means (43, 21) being located at the upper end thereof so that lubricant cannot gravitate therefrom should leakage occur across said seal means; means forming radially spaced outlet ports (65) located in underlying relationship respective to said bearing and seal chamber; an annulus (63) formed between said fixed and rotatable skirt members in underlying relationship respective to said outlet ports; lower seal means (63) located within said annulus with said lower seal means



being located above said resilient stripper seal so that leakage of fluid across the stripper seal and the last said seal means is diverted through said radial ports rather than into said bearing chamber;

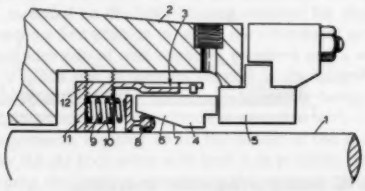
means forming first (54), second (50), and third (39) bearing means within said bearing and seal chamber, said first bearing means transfers an upward, vertical load from said rotatable inner skirt into said fixed outer skirt; said second bearing means transfers a downward and radially outward load from said rotatable inner skirt into said fixed outer skirt; and, said third bearing means transfers a radial load between said rotatable inner skirt and said fixed outer skirt.

4,157,187

ROTARY MECHANICAL FACE SEALS

John Kemp, Stoke Poges, England, assignor to Crane Packing Limited, Slough, England

Filed Nov. 28, 1977, Ser. No. 855,353
Int. Cl.[2] F16J 15/34
U.S. Cl. 277—87 10 Claims



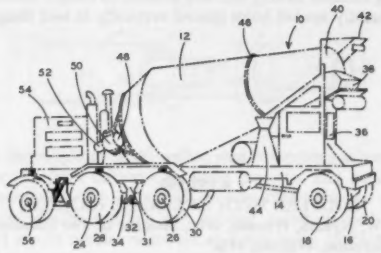
1. A sealing member for sealing an axially movable face seal member to an associated component such as a shaft comprising an annular body of graphite material of C-shaped cross-section and a supporting annular core member, said C-shaped cross-section of said annular body member embracing more than one-half of the cross-section of said core member.

4,157,188

TAG AXLE SUPPORT FOR CONCRETE MIXER UNITS

Royal W. Sims, 6451 Holladay Blvd., Salt Lake City, Utah 84121

Filed Jun. 13, 1977, Ser. No. 805,887
Int. Cl.[2] B60G 17/00
U.S. Cl. 280—81 R 4 Claims



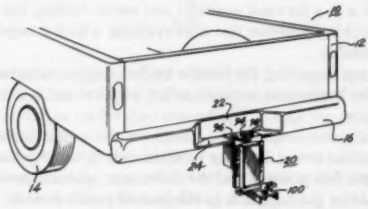
1. In a vehicle having a front support axle with steerable wheels and intermediate load bearing tandem axles including ground-engaging wheels, a tag axle at the rearmost part of said vehicle, ground-engaging wheels rotatably supported at opposite ends of said tag axle, a vehicle frame extending rearwardly of said tandem axle support wheels and including depending portions one at each side of said frame and adapted to support said tag axle, downwardly and rearwardly inclined support arms mounted for arcuate movement on said depending portions and adapted to receive said tag axle, resilient means for biasing said wheels and tag axle in a pivotally upwardly directed movement and out of ground supporting engagement, tag axle guide means, secured to opposite lateral sides of said tag axle, anti-friction bearing means operatively secured to said guide means operatively engaging said vehicle frame to limit movement of said tag axle essentially to vertically upward and downward movement to bring the associated wheel into-and-out-of ground engagement, and prohibiting lateral movement relative to said frame and twisting movement relative to said frame about a vertical axis, and an expandable power actuating means for effecting movement of said wheels carried by the tag axle downwardly into ground engagement and against the resistance of said resilient means.

4,157,189

TRAILER HITCH BRACKET

Roger G. Poley, Rte. 3, Howe, Ind. 46746

Filed Sep. 28, 1977, Ser. No. 837,085
Int. Cl.[2] B60D 1/06
U.S. Cl. 280—490 R 3 Claims



1. A trailer hitch bracket for mounting on the rear bumper of a pickup truck or other vehicle, comprising a first fixture having a forwardly extending, horizontally positioned plate for seating on and being secured to the bumper and a member rigidly attached to the rear of said plate and extending down-

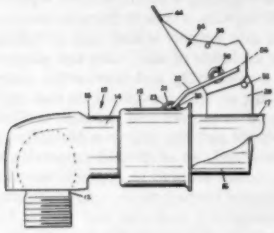
wardly therefrom, and a second fixture having a rearwardly extending member having a hole therein for receiving the stem of a hitch ball and a vertically extending member rigidly connected at its lower portion to the forward portion of said rearwardly extending member, a plurality of laterally spaced rearwardly facing holes in said downwardly extending member, a plurality of laterally spaced forwardly facing holes in said vertically extending member for matching with selected holes in said downwardly extending member, and bolts extending through said matching holes to secure said members rigidly together in a vertically adjusted position, said vertically extending member having laterally positioned flanges containing said laterally spaced holes spaced vertically in said flanges.

4,157,190

COUPLER WITH OPERABLE HANDLE

Oscar W. Nyman, Wausau, Wis., assignor to The Hammerblow Corporation, Wausau, Wis.

Filed Sep. 6, 1977, Ser. No. 830,395
Int. Cl.[2] B60D *1/06*
U.S. Cl. 280—512 **10 Claims**



1. In a coupler for a trailer wherein a ball is secured to one of either a vehicle or a trailer and the coupler is secured to the other of said vehicle or trailer, said coupler has a body and cap hinged together at a front portion so that the cap pivots about a front portion of the body, the body has means for mounting the coupler to a trailer or vehicle at a rear portion thereof, said body and cap being closable along parting faces thereof, each of said body and cap having internal recesses forming a cavity for said ball when the body and cap are closed along parting faces thereof, at least one of the body and cap having side surfaces tapering inwardly and rearwardly, a collar mounted for axial movement along the body for releasably latching said cap in a closed position to a said body, the collar having a front portion bearing against the tapered side surface when the collar is in a forward position, and means biasing the collar to the latching position, the improvement which comprises:

a handle;

means mounting the handle to the coupler mounting means for movement between a first position and a second position;

means for coupling the handle to the collar such that the collar is in a latching position only when the handle is in the first position and the collar is in a release position only when the handle is in the second position; and

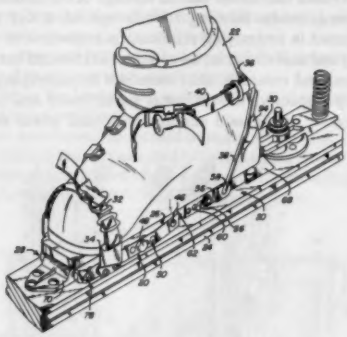
means for permitting slight axial adjustment of the collar when the collar is in the latching position and the handle is in the first position; whereby the collar automatically compensates for variations in ball size, cap and body thickness and taper to maintain the cap tightly latched to the body.

4,157,191

SKI BINDING

Paul C. Ramer, Rte. 4, Box 344, Golden, Colo. 80401

Filed Nov. 25, 1977, Ser. No. 854,595
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—614 **5 Claims**



1. A ski binding for releasably connecting a ski boot to a ski comprising, in combination:

a toe piece mounted on said ski and including laterally extending pin means having a cam surface on an end thereof;

a boot plate member connectable to the ski boot and having a main body portion, said main body portion including connection means at a forward end thereof adjacent the toe of the ski boot for releasably connecting with the pin means of said toe piece, said connection means including a release socket for receiving the end of said pin means, said pin means and said connection means being cooperatively operable for movement with respect to one another to release said pin means from said release socket, said release socket having a groove formed therein extending generally perpendicularly relative to the ski, said groove in said release socket facilitating upward relative separation of the end of said pin means from the release socket of said connection means; and

a heel piece mounted on said ski operatively associated with said boot plate member so as to be selectively capable of holding the heel of the boot plate member adjacent the ski.

4,157,192

SKI BINDING APPARATUS

Frank Hrachowitz; Rossler Ernst, both of Vienna, and Josef Svoboda, Schwechat, all of Austria, assignors to Gertsch AG, Zug, Switzerland

Continuation of Ser. No. 554,714, Mar. 3, 1975, abandoned. This application Jul. 28, 1976, Ser. No. 709,416
Claims priority, application Austria, Mar. 14, 1974, 2215/74; Dec. 4, 1974, 9706/74
Int. Cl.[2] A63C *9/086*
U.S. Cl. 280—618 **12 Claims**

1. A ski binding arrangement, comprising:

an elongated plate separate from a ski and adapted to have a sole of a ski boot mounted on an upper surface thereof, said plate having an inclined surface adjacent one end thereof inclined to the plane of said upper surface;

spaced holding means connected to said plate adjacent the

ends thereof for holding a toe and a heel portion of said ski boot onto said upper surface of said plate;

spaced releasable securement means mounted on said ski for releasably securing both ends of said plate to said ski with a predefined magnitude of force, said securement means including at least one support member mounted on said ski adjacent said one end of said plate and said inclined surface thereon and a movable locking member mounted on said support member, guide means on said support member for guiding the movement of said locking member into and out of overlapping relation with said inclined surface on said plate, said guide means effecting a movement of said locking member in a direction generally parallel to said inclined surface;

fixed stop means on said support member for limiting the movement of said locking member at least in a direction of movement thereof toward said overlapped relation with said inclined surface; and

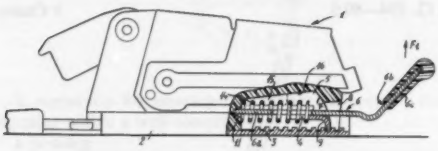
resilient means for urging said locking member into engagement with said stop means and to said overlapping position, said resilient means yielding to a predefined force applied thereto by said locking member in response to a relative movement between said plate and said ski during a placing of said plate between said spaced releasable securement means.

4,157,193

SKI BINDING DEVICE

Jean J. A. Beyl, 10, Boulevard Victor Hugo, Nevers, Nievre, France

Filed Oct. 27, 1977, Ser. No. 846,126
Claims priority, application France, Nov. 2, 1976, 76 32948
Int. Cl.[2] A63C *9/08*
U.S. Cl. 280—633 **10 Claims**



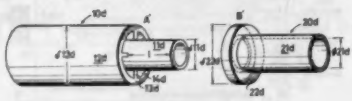
1. A device for binding a ski boot on a ski, wherein said device comprises a base adapted to be fixed on a ski, a binding member slidably mounted on said base for displacement in the direction of the longitudinal axis of the ski and adapted to grip one end of the ski boot, means for adjusting the position of said binding member on said base, said means comprising a series of retaining members spaced in the longitudinal direction on the base, an adjustment member adapted to engage one of said retaining members, a lever carrying said adjusting member and movably mounted on the boot-binding member for displacement between a first position in which the adjustment member is engaged with one of said retaining members and a second position in which said adjustment member is disengaged from said retaining members, the boot-binding member being capable of displacement in one longitudinal direction with respect to said adjustment member under the action of the pressure exerted by the ski boot when said boot is in position, resilient means urging the binding member in the opposite direction, and locking means carried by said boot-binding member urging said adjustment member into engagement with one of said retaining members when the binding member has been displaced in the said one longitudinal direction under the pressure exerted by the ski boot when said boot is in position.

4,157,194

THERMOPLASTIC MULTI-WALLED PIPES

Kelichi Takahashi, Ichikawa, Japan, assignor to Tokan Kogyo Co., Ltd., Tokyo, Japan

Filed May 25, 1977, Ser. No. 800,427
Claims priority, application Japan, May 27, 1976, 51-67004; Jun. 4, 1976, 51-71575; Jul. 1, 1976, 51-77054; Jul. 1, 1976, 51-77055; Jul. 6, 1976, 51-79518; Feb. 18, 1977, 52-16117; Feb. 18, 1977, 52-16118
Int. Cl.[2] F16L *39/00, 47/02*
U.S. Cl. 285—3 **14 Claims**



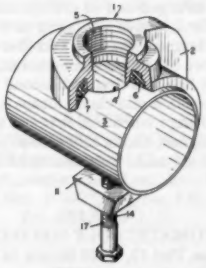
1. A thermoplastic multi-walled pipe comprising at least two tubular members different in inside diameter and concentrically arranged with a hollow portion therebetween, and a plurality of ribs spacing said tubular members and being bonded to said tubular members, said pipe being characterized in that the strength of the bond per unit area between inner end surfaces of said ribs and the outer surface of an inner one of said tubular members is weaker than that between outer end surfaces of said ribs and an inner surface of a next outer one of said tubular members, said bond differential forming means whereby an end of the outer tubular member and ribs may be stripped for a predetermined length in the longitudinal direction to expose said inner tubular member.

4,157,195

JUNCTION COUPLING FOR PROVIDING A FLUID FLOW BRANCH FROM A MAIN CONDUIT

Francis X. Costanzo, Pittstown, and Lawrence W. Thau, Jr., Newark, both of N.J., assignors to Victaulic Company of America, South Plainfield, N.J.

Filed Feb. 15, 1978, Ser. No. 878,106
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—4 **8 Claims**



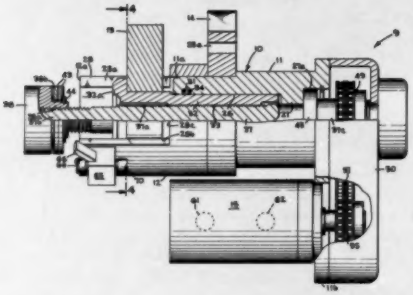
1. A junction coupling for use with a pipe having an aperture in the pipe wall, said coupling comprising a generally C-shaped member having an outlet duct extending through the coupling wall for registering with said pipe aperture and securing means also extending through the coupling wall at a location substantially in diametric alignment with said outlet duct, the distance between the end extremities defining the opening of the C-shaped member being less than the overall diameter of the pipe but of a dimension sufficient to permit the coupling member to be applied radially to said pipe at the location of the aperture and secured by said securing means partly surrounding said pipe with said aperture and outlet duct in registering alignment.

4,157,196

HYDRAULIC COUPLING DEVICE

Jean C. de Meulemeester, Fontainebleau, France, assignor to FMC Corporation, San Jose, Calif.

Filed Sep. 13, 1977, Ser. No. 832,772
Claims priority, application France, Sep. 13, 1976, 76 27459
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—18 **7 Claims**



1. A coupling device for drawing two flanges together, said device comprising:

a body member having an axial bore open at one end and having a thrust bearing at the other end;

a sleeve slidably mounted in said bore of said body member, said sleeve having an axial bore with an inner screw thread in said axial bore;

an annular spindle having an enlarged portion at each end thereof and an outer screw thread on the portion of the spindle between said enlarged portions, a first of said enlarged portions being rotatably mounted in said thrust bearing of said body member, said outer screw thread portion of said spindle being mounted in screw engagement with said inner screw thread of said sleeve;

a means for securing said body member to the first one of said flanges;

movable clamp means mounted on said sleeve and having a working surface for contacting the second one of said flanges;

a resilient stop means;

means for mounting said stop means between said sleeve and said second enlarged end of said spindle; and

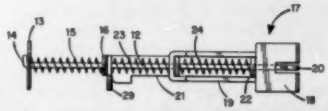
power means for selectively rotating said spindle to thereby cause said clamp means and said sleeve to slide axially along said bore of said body member and for pivoting said clamp means between first and second positions, wherein in said first position said clamp means is located to contact said second flange when said first and said second flanges are axially aligned, and in said second position said clamp means is located aside from said axial alignment.

4,157,197

AUTOMATIC BOLT MECHANISM

Timothy F. Wilson, Flat 10, 14-18 Sheehy St., GLEBE, Sydney, New South Wales, Australia (2037)

Filed Mar. 28, 1977, Ser. No. 781,950
Claims priority, application Australia, Apr. 6, 1976, 5505/76
Int. Cl.[2] E05C *1/08*
U.S. Cl. 292—179 **4 Claims**



1. A latch bolt mechanism for a door and adapted to co-operate with a striker plate, said mechanism comprising, in combination:

frame means adapted to be mounted in fixed relationship to said door;

a plunger rod having a head end and a tail end and movable relative to said frame means longitudinally between a first limiting position in the direction defined by its head end and a second limiting position in the direction defined by its tail end and having means associated with its head end to engage said striker plate when said door is closed whereby said rod is prevented from attaining its said first limiting position;

first spring means tending to urge said rod towards its first limiting position relative to said frame means;

a bolt slidably mounted on said rod near its head end and movable relative to said frame means between a protrudent position at which in use it may engage said striker plate and a withdrawn position at which in use it will clear said striker plate;

an actuator slidable on said rod relative to each of said frame means and said bolt and limited in its ability to move towards the tail end of said rod relative to said bolt by means on said actuator which engage co-operating means on said bolt;

second spring means acting directly on said actuator and tending to urge said actuator relative to said bolt towards the tail end of said rod;

third spring means also acting directly on said actuator and tending to urge said actuator relative to said rod towards the tail end of said rod; and

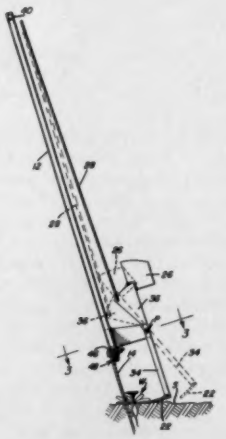
releasable retaining means movable relative to said frame means able to lock said actuator in a fixed position relative to said frame means against the influence of said second and third spring means.

4,157,198

WEED REMOVING TOOL

William C. McDaniels, 1400 Cimarron, Hobbs, N. Mex. 88240

Filed Jan. 18, 1978, Ser. No. 870,563
Int. Cl.[2] A01B *1/18*
U.S. Cl. 294—50.9 **9 Claims**



1. A weed removing tool comprising an elongated shaft having a pair of spaced ends; a handle attached at one of said ends; a blade affixed to the other of said ends, said blade being in substantial alignment with said shaft; a rake mounting means extending normally from said shaft; a rake means pivotally mounted on said rake mounting means, said rake means having one end thereof extending alongside said blade for cooperation

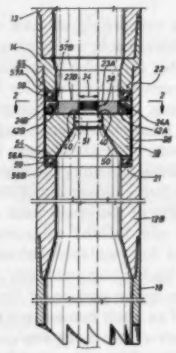
with said blade upon pivoting of said rake means on said rake mounting means; said rake means further including an opposite end having a near side and a far side, said far side being spaced from said shaft and said near side being positioned between said far side and said shaft; a counterweight fixedly attached to said far side; and an elongated activation element pivotally attached to said near side for causing pivotal motion of said blade means upon the imparting of a force thereto.

4,157,199

APPARATUS FOR RETRIEVING A TUBULAR MEMBER FROM A WELL

Robert C. Klingman, Houma, La., assignor to Wilson Industries, Houston, Tex.

Filed Aug. 3, 1977, Ser. No. 821,462
Int. Cl.[2] E21B *31/00*
U.S. Cl. 294—86.29 **24 Claims**



1. Apparatus for grasping the exterior surface of a tubular member within a well comprising:

a housing;

a centralizer having an inclined guiding surface thereon and an opening therethrough disposed within said housing and rotatable relative thereto;

first and second flapper members, each having a cutout portion therein, pivotally mounted within said centralizer for pivotal movement relative to the axis of said housing between a closed position and an open position, said flapper members in the closed position extending substantially perpendicularly to the interior surface of said housing so that said cutout portions register to define an opening therebetween less than the outer diameter of a tubular member to be grasped, said opening in said flappers axially registering with said opening in said centralizer;

means for graspingly engaging a tubular member from the exterior thereof mounted on the ends of each of said first and second flapper members;

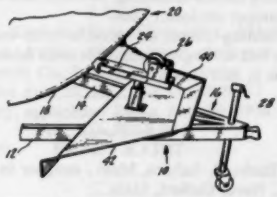
said flapper members being responsive to abutting contact with a tubular member as said housing is moved in a downhole direction by pivoting toward the open position, said flapper members being responsive to movement of said housing in an uphole direction by pivoting toward the closed position to thereby bring said grasping means into engagement with the exterior surface of a tubular member.

4,157,200

ROAD DEBRIS DEFLECTOR FOR BOAT TRAILERS AND OTHER TOWING VEHICLES

Jarold W. Johnson, 7927 McGroarty, Sunland, Calif. 91040

Filed Aug. 25, 1977, Ser. No. 827,712
Int. Cl.[2] B62D *35/00*
U.S. Cl. 296—1 S **3 Claims**



1. In combination with a boat trailer having a generally open frame for receiving the hull of a boat with the bow thereof directed forwardly towards a hitching portion of the trailer, a gravel deflector for protecting at least forward under portions of a boat hull on the trailer from gravel and stones thrown rearwardly by wheels of a towing vehicle during towing of the trailer and boat, which comprises:

(a) a deflecting member having major portions thereof substantially flat and adapted for resting against longitudinal beams of the trailer frame and having side edge portions thereof, in at least a forward region, converging inwardly towards a transverse forward edge portion, and having a transverse rearward edge portion substantially longer in transverse direction than said forward edge portion,

said forward edge portion being inclined upwardly and forwardly relative to said major flat portion, said converging side edge portions being inclined upwardly and generally forwardly and outwardly relative to said major flat portion and said rear edge portion being inclined downwardly and rearwardly relative to said major flat portion, said member being positioned longitudinally such that with said forward edge portion adjacent the hitching portion said rear edge portion lies generally beneath upswept bow portions of the boat carried on the trailer; and

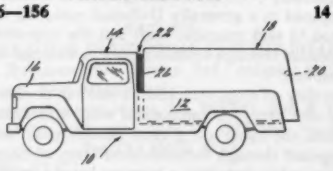
(b) means for fastening the deflecting member to forward portions of the trailer just rearwardly of the hitching portion in a position to deflect gravel, stones and the like thrown rearwardly by wheels of a towing vehicle away from a boat carried on the trailer.

4,157,201

PICK-UP TRUCK CAMPER DOOR ASSEMBLY

John M. Collins, Elkhart, Ind., and Charles T. Mountain, Orchard Lake, Mich., assignors to Leer, Inc., Elkhart, Ind.

Filed Sep. 2, 1977, Ser. No. 830,026
Int. Cl.[2] B60P *3/32*
U.S. Cl. 296—156 **14 Claims**



1. A door assembly for providing access between the interior of a pick-up type truck passenger compartment or cab and the interior of a camper enclosure mounted on the load-carrying bed of the truck,

said door assembly including a one-piece generally rectangular shaped door frame extending substantially the entire

height of the cab interior and secured around the periphery thereof to the rearward side of said cab,

a door hingedly mounted along a generally vertically extending axis so as to be movable between enclosed position arranged generally coplanar of said rearward side of said cab and an open position extending outwardly into said camper compartment,

first sealing means extending between said door frame and said camper enclosure, and

second sealing means cooperable with said first sealing means and sealingly engageable with said door when said door is in said closed position.

4,157,202

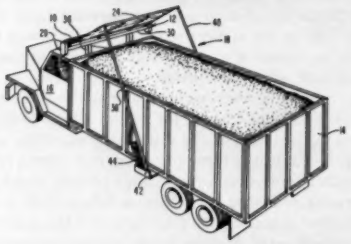
TRUCK COVER

Ernest C. Bachand, Auburn, Mass., assignor to Pioneer Cover-All, Inc., North Oxford, Mass.

Filed Dec. 5, 1977, Ser. No. 857,563

Int. Cl.[2] B60J *7/06*

U.S. Cl. 296—100 **6 Claims**



1. For use with an open top truck body, a truck cover comprising:

an assembly disposed at the forward end of a truck body and having a rotatable shaft and motive means coupled thereto for rotating the shaft in a forward or a reverse direction;

a frame having a pair of spaced generally parallel legs, the lower ends of which are pivotally mounted at respective sides of the truck body, and a cross member connecting the upper ends of said legs;

means for urging said frame into a rearward position with said cross member generally at the rear end of the truck body;

a cover sheet of flexible material secured at its forward edge to said assembly and at its rearward edge to said cross member of said frame;

a plurality of cables disposed along spaced parallel paths and secured at one end to said rotatable shaft and at the opposite end to said cross member, the cables being of a length to extend substantially along the full length of the truck body and cover sheet;

said plurality of cables including first and second cables each disposed in a generally U-shaped path, the free ends affixed to said rotatable shaft and the opposite end being threaded through rotatable pulleys attached to said cross member;

a plurality of rings attached to said cover sheet in spaced parallel arrays in alignment with said spaced parallel paths, the cable along each parallel path being slidably disposed through the associated array of rings;

said assembly including a housing having openings therein through which said cables are disposed and of a size and configuration to prevent entry of said rings through said openings;

said rotatable shaft being operative upon rotation in a forward direction to wind said cables onto the shaft to draw the cover sheet forward into a furled position at said assembly, and operative upon rotation in a reverse direction to unwind said cables from the shaft and permit the cover sheet to unfurl into its open position by the action of said frame.

4,157,203

ARTICULATED DOUBLE BACK FOR CHAIRS

Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 795,108, May 9, 1977, abandoned. This application May 1, 1978, Ser. No. 902,287

Int. Cl.[2] A47C *3/00*

U.S. Cl. 297—300 **22 Claims**

1. A chair back comprising at least one back-supporting frame member, a lower back, means mounting the lower back on the frame member for backward tilting movement about a first horizontal, transverse axis and for yieldably restraining such backward tilting, the first axis being located substantially above the seat at a location corresponding to about the middle of the anatomical back of an adult human sitting in the chair, an upper back, and means mounting the upper back on the lower back for backward tilting movement of the upper back relative to and independently of the lower back about a second horizontal, transverse axis located substantially above the first horizontal axis and for yieldably restraining such backward tilting, the lower back being vertically and transversely co-extensive with the major portion of the middle part of the anatomical back of an adult human, and the upper back being verticallly and transversely co-extensive with the major portion of the upper part of the anatomical back of an adult human in the region where the spine curves forward when such human is sitting upright and straightens when such human arches backward.

4,157,204

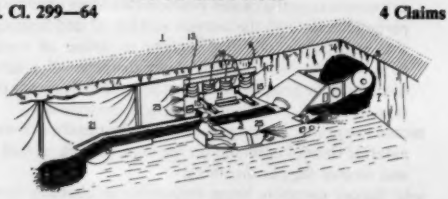
FACE VENTILATION SYSTEM FOR COAL MINES

Fred N. Kissell, Pittsburgh, Pa., and Joseph E. Matta, Bel Air, Md., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jul. 27, 1978, Ser. No. 928,494

Int. Cl.[2] E21C *35/22*

U.S. Cl. 299—64 **4 Claims**



1. A ventilation system for providing proper ventilation near the working area of a mine comprising in combination:

a mining machine having a frontal cutterhead adapted to engage the mine working area to be ventilated;

an air control panel mounted on said mining machine and

extending along one side thereof and movable with the machine;

a line curtain fixed to said mine and extending between the mine floor and roof, said curtain being spaced from said mine wall and panel to form fluid conduits between said panel and line curtain and said curtain and mine wall, when in a proper operating mode, extending in the same general direction; and

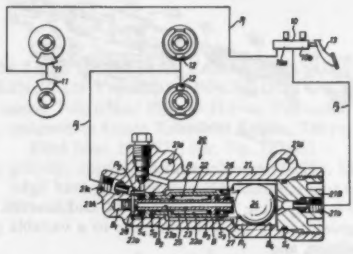
air movement control means mounted on the machine for preventing air flow in the conduit between the panel and line curtain and for promoting the flow of air on the opposite side of the machine towards the cutterheads and into the conduit between the line curtain and wall.

4,157,205

INERTIA-CONTROLLED VALVE UNIT FOR VEHICLE BRAKING SYSTEMS

Tomoyuki Nogami, Toyota, and Takaaki Ohta, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 28, 1977, Ser. No. 865,259
Claims priority, application Japan, Jan. 12, 1977, 52-2697
Int. Cl.[2] B60T *8/14*
U.S. Cl. 303—24 A **5 Claims**



1. An inertia-controlled valve unit for incorporation between a master cylinder and wheel brake cylinders in a vehicle braking system, comprising:

a housing provided at opposite ends thereof with an inlet port for connection to said master cylinder and an outlet port for connection to said wheel brake cylinders and provided therein with a stepped bore in open communication with said inlet and outlet ports respectively at the large and small diameter portions thereof;

a differential piston slidably disposed within the small diameter portion of said housing bore to provide first and second fluid chambers respectively in open communication with said inlet and outlet ports, said piston being provided therein with an axial stepped bore in open communication with said first and second chambers respectively at the large and small diameter portions thereof and having piston surfaces providing first and second effective piston areas whereby opposing displacement forces may be provided on said piston respectively in the directions toward and away from said inlet port;

a tubular stepped spool slidably disposed within the axial stepped bore of said piston to permit the flow of fluid between said first and second fluid chambers therethrough, said spool having one end fixedly connected to the inner wall of said housing in said second chamber and the other end exposed in said first chamber;

a coil spring disposed within an annular space between said piston and said spool and being engaged at one end thereof with a stepped portion of said spool and at the other end thereof with an inner shoulder of said piston to bias said piston toward said second chamber; and

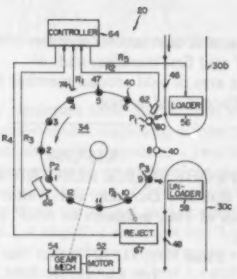
a cut-off valve including a valve seat provided on the other end to said spool and an inertia-controlled ball housed within the large diameter portion of said housing bore to co-operate with said valve seat, said ball rolling into engagement with said valve seat to interrupt the flow of fluid from said first chamber to said second chamber when said ball is subjected to a deceleration in excess of a predetermined value.

4,157,206

APPARATUS FOR MANUFACTURING ELECTRIC LAMPS

Takeshi Ikeda, Kanuma; Kozo Kawashima, Yokohama, and Tetsunori Kai, Fuchu, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 29, 1977, Ser. No. 828,592
Claims priority, application Japan, Aug. 30, 1976, 51-103446
Int. Cl.[2] H01J *9/48*
U.S. Cl. 316—27 **9 Claims**



1. An apparatus for manufacturing electric lamps having at least one of a group of means including washing means, coating means, sealing means, exhausting means, basing means and aging means, said apparatus comprising:

a plurality of heads;

means for moving said heads;

said plurality of heads cooperating with at least one of said group of means to serially effect the function of said at least one of said group of means on the bulb members held by said plurality of heads;

unloading means for successively taking the bulb members from the heads after said function is effected;

loading means for successively supplying new bulb members to the head;

inspection means for inspecting each bulb member while moving along said closed loop and delivering an output signal upon detecting a bad bulb member; and

controlling means including memory means for storing the identity of the head holding a bad bulb member upon receipt of the output signal from the inspection means, and means for sending a signal to said loading means for stopping the supply of new bulb members to the head holding the bad bulb member.

4,157,207

SOCKET FOR ELECTRICAL CIRCUIT BOARD

Samuel C. Robinson, New Albany, Ind., assignor to Robinson Nugent Inc., New Albany, Ind.

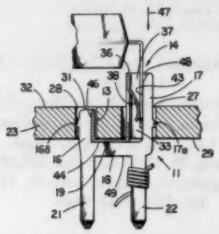
Continuation-in-part of Ser. No. 803,631, Jun. 6, 1977, abandoned. This application May 24, 1978, Ser. No. 908,984
Int. Cl.[2] H05K *1/12*
U.S. Cl. 339—17 C **39 Claims**

1. An electrical connector comprising:

a first member having a generally U-shaped portion with a horizontal bight and vertical left and right arms at opposite ends of said bight,

said right arm including a channel having a vertically extending opening at one side of the arm, and said right arm including a spring projecting into said channel from a wall of said channel;

a second member having a generally U-shaped portion with a horizontal bight and vertical left and right arms at opposite ends of said bight,



said left arm of said second member being adjacent said left arm of said first member; and

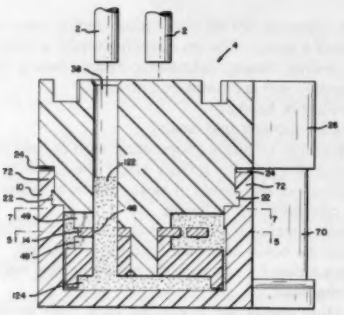
said right arm of said second member being in the channel and adjacent said spring.

4,157,208

WATERPROOF SPLICE ELECTRICAL CONNECTOR

Lincoln E. Roberts, Dunedin, and Walter M. Young, Pinellas Park, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 11, 1977, Ser. No. 850,584
Int. Cl.[2] H01R 7/04
U.S. Cl. 339—98 **10 Claims**



1. An electrical connector for establishing electrical contact with a plurality of wires comprising:

(a) a first means further comprising an assembly of:

(i) a first insulating member having a tubular passage for each wire to be contacted extending from an exterior first face through the interior of said first insulating member to an opposite interior second face,

(ii) a second insulating member having a like number of tubular passages extending therethrough from a third interior face to an opposite fourth interior face,

(iii) a metallic plate-like member having a number of slots, each said slot defining a portion of a circular arc,

(b) second means for securing said first insulating member to said second insulating member with said second face on said first insulating member being adjacent to said third interior face on said second insulating member and with said number of tubular passages in said first insulating member being aligned with said like number of tubular passages in said second insulating member, said second face being spaced from said third face by a distance at least equal to the thickness of said metallic plate-like member, said metallic plate-like member being positioned between said second and third face with said slots transversely aligned with said tubular passages, said metallic plate-like member being free to rotate relative to said first and second insulating members,

(c) a third means comprising a third insulating member further comprising a bottom wall with an upstanding peripheral exterior wall defining an interior cavity,

(d) fourth means for anchoring said plate-like member to said third insulating member to prevent relative rotation therebetween, when said first means is positioned at least partially within said cavity formed in said third insulating member, said third means being capable of rotation relative to said first means, whereby

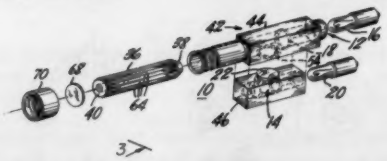
a wire may be placed in each of said aligned tubular passages extending past one of said slots so that upon rotation of second means relative to said first means, said wires enter said slots establishing electrical contact between each said wire and said plate-like member.

4,157,209

OPTICAL DEVICE HAVING LIGHT-MIXING ELEMENT

Pasquale J. Amendolia, St. James, N.Y., assignor to Varilite Corporation, Nesconset, N.Y.

Filed May 23, 1978, Ser. No. 908,744
Int. Cl.[2] G01F 23/28; G02B 5/14; G08B 5/00
U.S. Cl. 350—96.16 **23 Claims**



1. In an optical device comprising

at least two contrastingly-colored sources of light,

means for adjusting the brightness of said sources of light relative to each other in response to a variable physical condition, and

a mixing element formed with a light-entrance portion to permit entrance into said mixing element of light emanating from said sources and with a display surface that communicates optically with said entrance portion and facilitates viewing of a display of the light entering said mixing element through said entrance portion and propagated through said mixing element to said display surface, the light as displayed having a color that depends on the relative brightness of said sources,

the improvement wherein

said mixing element has at least in part generally the shape of a cylinder formed with an axial bore so that said mixing element has an outer surface and an inner surface,

at least one of said outer and inner surfaces comprising a plurality of axially-extending segments, and

at least some of the light emanating from said sources and entering said mixing element through said entrance portion being multiply reflected from said outer and inner surfaces and scattered by said axially-extending segments,

whereby thorough mixing of the light in said mixing element and display is achieved, thereby providing an indication of said variable physical condition.

4,157,210

TRAFFIC CHANNELING DEVICE

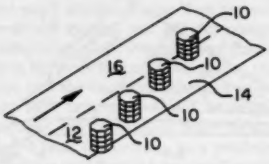
James W. Mesman, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Filed Jun. 9, 1977, Ser. No. 805,192
Int. Cl.[2] G02B 5/12
U.S. Cl. 350—97 **14 Claims**

1. A traffic channeling device for positioning on a highway in the normal traffic flow pattern, comprising in combination:

(a) a moisture-proof paperboard shell structure including a frame having a substantially uniform cross-section and an open end, and having formed on the other end thereof a

plurality of flaps, said shell structure being designed for standing on the highway in a vertical position with said open end upward so that at least some of said flaps are in contact with the highway surface, said flaps further being designed so that they may be folded inwardly or outwardly as desired by the user of the device;



(b) means, associated with the outside of said shell structure, for warning the traffic flow that the device has been positioned on the highway in the normal traffic flow; and

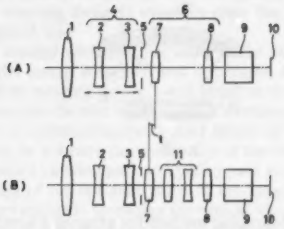
(c) means, associated with said folded flaps, for holding said vertical standing shell structure in a predetermined position on the highway.

4,157,211

ZOOM LENS HAVING AN EASILY CHANGEABLE RANGE OF VARIABLE FOCAL DISTANCE

Kazuo Tanaka, Tokyo, and Ryusho Hirose, Yokosuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,852
Claims priority, application Japan, Mar. 19, 1976, 51-30495
Int. Cl.[2] G02B *15/12, 15/16*
U.S. Cl. 350—183 **4 Claims**



1. A zoom lens adapted to have a range of a variable focal distance easily changed comprising:

a focusing lens part;

a zooming lens part which is positioned at an imaging plane side of said focusing lens part and consists of a plurality of movable lens group to vary a focal distance;

an image forming lens part which consists of a front lens group and a rear lens group for imaging the luminous flux from said zooming part;

a diaphragm positioned between said zooming lens part and said image forming part;

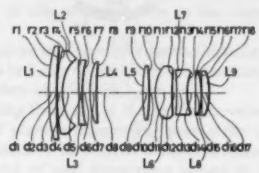
an attachment lens provided in a freely insertable and removable manner at an optical path between said front lens group and rear lens group, a portion of the lenses of said front lens group and said rear lens group positioned closer to an imaging plane side of said diaphragm being shifted along a direction of the optical axis in response to the insertion of the attachment lens on an optical axis of said front lens group and said rear lens group, said portion of said lenses comprising means for separating the exit pupil of said zoom lens from said image plane in response to the insertion of said attachment lens.

4,157,212

LARGE APERTURE MINIATURE WIDE-ANGLE ZOOM LENS SYSTEM

Ryota Ogawa, Tsurugashima, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1977, Ser. No. 835,279
Claims priority, application Japan, Sep. 22, 1976, 51-114289
Int. Cl.[2] G02B *15/16*
U.S. Cl. 350—184 **2 Claims**



1. A large aperture miniature wide-angle zoom lens system constructed in two components comprising a front lens group which is relatively movable with respect to a rear lens group, said front lens group being composed of four lens elements and said rear lens group being composed of five lens elements, said lens elements in order from the object side to the image side being a positive lens L_1, a negative meniscus lens L_2, a double concave lens L_3, a positive lens L_4, a double convex lens L_5, a thick positive lens L_6, a double concave lens L_7 and two positive lenses L_8 and L_9, the radii of curvature r_1 to r_{18}, the thicknesses or separations d_1 to d_{17}, the refractive indicies n_1 to n_9 and the Abbe' numbers ν_1 to ν_9 satisfying the following conditions:

Aperture Ratio 1:2.86
Focal Length f = 28.8 ~ 44.0
Angle of View 2ω = 75.2° ~ 52.3°

Lens	Radius of Curvature	Thickness or Spacing	Index of Refraction	Abbe' Number
L_1	$r_1 = 73.187$	$d_1 = 3.60$	$n_1 = 1.58913$	$\nu_1 = 61.1$
	$r_2 = 339.741$	$d_2 = 0.10$		
L_2	$r_3 = 90.633$	$d_3 = 1.60$	$n_2 = 1.80610$	$\nu_2 = 40.9$
	$r_4 = 19.167$	$d_4 = 7.46$		
L_3	$r_5 = -400.000$	$d_5 = 1.60$	$n_3 = 1.64000$	$\nu_3 = 60.2$
	$r_6 = 49.487$	$d_6 = 3.26$		
L_4	$r_7 = 34.000$	$d_7 = 3.00$	$n_4 = 1.80518$	$\nu_4 = 25.4$
	$r_8 = 94.650$	$d_8 = 19.829 \sim 2.040$ (variable)		
L_5	$r_9 = 81.015$	$d_9 = 3.00$	$n_5 = 1.77250$	$\nu_5 = 49.7$
	$r_{10} = -66.820$	$d_{10} = 2.03$		
L_6	$r_{11} = 21.500$	$d_{11} = 7.00$	$n_6 = 1.65844$	$\nu_6 = 50.9$
	$r_{12} = 94.396$	$d_{12} = 1.99$		
L_7	$r_{13} = -62.900$	$d_{13} = 4.28$	$n_7 = 1.84666$	$\nu_7 = 23.9$
	$r_{14} = 21.928$	$d_{14} = 3.59$		
L_8	$r_{15} = -350.000$	$d_{15} = 2.60$	$n_8 = 1.58267$	$\nu_8 = 46.4$
	$r_{16} = -31.044$	$d_{16} = 0.10$		
L_9	$r_{17} = -250.000$	$d_{17} = 3.16$	$n_9 = 1.51633$	$\nu_9 = 64.1$
	$r_{18} = -28.889$			

4,157,213
MULTIFOCAL LENGTH LENS

Edward H. Phillips, 30 King George Rd., Warren, N.J. 07060

Continuation-in-part of Ser. No. 625,176, Oct. 23, 1975, abandoned. This application Jul. 20, 1977, Ser. No. 817,190
Int. Cl.[2] G02B 5/16; G02C 7/06
U.S. Cl. 351—168 14 Claims

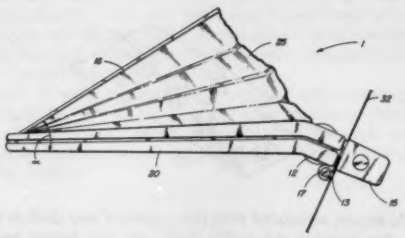
1. A multifocal length lens comprising:
a multiplicity of elongate glass rods each having a diameter and a first index of refraction and being positioned in generally parallel side-by-side relationship;
a multiplicity of concentric layers, each surrounding one of said glass rods and each having a thickness approximately half the diameter of each rod and a second index of refraction different from said first index of refraction, one of said first and second indexes of refraction being suitable for use in distance vision and the other of said indexes of refraction being suitable for use in near vision, whereby light is transmitted longitudinally through both said rods and said concentric layers so that different focal lengths are obtained upon looking longitudinally through either said rods or said concentric layers of the multifocal lens, said glass rods and surrounding concentric layers forming a plurality of viewing rods, all said viewing rods being identical, said viewing rods all being fused together in side-by-side relationship with sufficient intimacy so that individual surrounded viewing rods are not visually discernible when viewing through the lens, all of said viewing rods being identical so that all rods adjacent any given rod are identical with said given rod and all viewing rods being uniformly arranged throughout the lens so that each unit area of the lens in all radial directions thereof is similar to all other unit areas of the lens, thereby providing the lens with uniform optical characteristics so that optical jump and other optical aberrations are not experienced when viewing through different portions of the lens or shifting the gaze from one portion of the lens to another portion thereof; all of said fused viewing rods having both ends thereof being ground so that adjacent ends of said viewing rods all have a common radius of curvature thereby forming a uniform lens having multifocal properties.

4,157,214
APPARATUS FOR SHOWING MICRODOCUMENTS

Stephen P. Hines, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 675,100, Apr. 9, 1976, abandoned. This application Nov. 25, 1977, Ser. No. 854,926
Int. Cl.[2] G03B 21/30, 21/56; G02B 3/08
U.S. Cl. 353—70 13 Claims

1. A compact microdocument reader comprising:
a light source;
a projection gate for positioning a microdocument which is to be read;
a wide-angle condenser system for concentrating light from said light source on a microdocument positioned at said projection gate, thereby illuminating said microdocument;
a wide-angle projection lens
a light-distributive screen, positioned at an acute angle to the axis of projection of said projection lens whereby a first image portion projected by said lens onto the edge of said screen which is positioned closest to said projection lens is smaller in size than is a second image portion projected on the edge of said screen farthermost from said projection lens; and

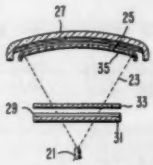


a Fresnel lens, disposed relative to said light-distributing screen at a predetermined angle such that the first image portion is magnified by said Fresnel lens to a point such that it appears to a viewer, viewing said first and second image portions through said Fresnel lens, equal in size to the second image portion.

4,157,215
PHOTODEPOSITION OF CRT SCREEN STRUCTURES USING CERMET IC FILTER

Joseph J. Hanak, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,247
Int. Cl.[2] G03B 41/00
U.S. Cl. 354—1 10 Claims



1. In a photographic method for printing a screen structure for a cathode-ray tube including projecting a light field (a) through a light-transmission filter comprising inorganic light-absorbing particles, said filter having tailored variations in light transmission for producing predetermined variations in light intensity in said light field, (b) through a photographic master, and (c) incident upon a photosensitive layer, the improvement wherein said filter comprises a cermet layer constituted of inorganic light-absorbing metal particles nonuniformly distributed in an inorganic light-transmitting medium in predetermined manner to provide said tailored variations in light transmission.

4,157,216
ADAPTER FOR OPTICALLY COUPLING A PHOTOGRAPHIC CAMERA WITH A VIEWING DEVICE

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

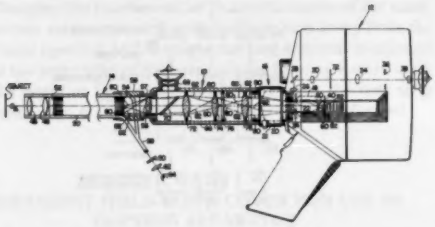
Filed Jun. 26, 1978, Ser. No. 918,779
Int. Cl.[2] G03B 29/00, 17/48; A61B 1/06
U.S. Cl. 354—62 5 Claims

1. An adapter for use in optically coupling a photographic camera to the proximal end of an optical viewing device such as an endoscope so that the image of an object formed by the

optical viewing device can simultaneously be viewed and photographed, the camera being of the type which has a through-the-lens viewing system whose entrance pupil occupies only a portion of the camera's taking entrance pupil and which is laterally offset with respect to the optical axis of the camera's taking lens and the optical viewing device being of the type which has an eyepiece located at its proximal end for forming a collimated to nearly collimated object image and having an exit pupil smaller in size than the entrance pupil of the camera's optical system, said adapter comprising:

a housing adapted to make a mechanical generally light-tight connection between the proximal end of the optical viewing device and the camera's objective taking lens;

a first relay lens, mounted in said housing in position to intercept light rays emerging from the optical viewing device's eye lens, for forming at a predetermined spatial location within said housing an aerial image of the object being viewed by the optical viewing device's optical system;



a second relay lens mounted in said housing at a predetermined spaced distance from said first relay lens and adjacent the camera's objective taking lens for allowing said camera's objective lens to be focused on said aerial image, said relay lenses being structured and spaced to image the optical viewing device's eyepiece onto the camera's entrance pupil; and

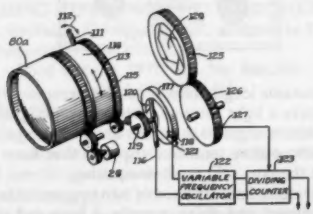
a diffuser located within said housing in the plane in which said aerial image is formed and structured for spreading the optical viewing device's exit pupil so that it substantially matches the size of the camera's entrance pupil, said diffuser in combination with said lenses of said adapter operating to enhance the uniformity of the illumination in the camera's viewing path and taking path and to preclude vignetting of the entrance pupil of the camera's viewing system by optically spreading the optical viewing device's exit pupil to match its size with that of the camera's entrance pupil.

4,157,217

AUTOMATIC FOCUS ADJUSTING SYSTEM

Tadao Isono, Kokubunji, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha, Higashimurayama, Japan

Filed Jan. 23, 1978, Ser. No. 871,726
Claims priority, application Japan, Jan. 22, 1977, 52/005405
Int. Cl.[2] G03B *3/00, 7/08*
U.S. Cl. 354—25 **7 Claims**



1. For a camera having an adjustable exposure system, a focusable objective lens, a main lens with a variable focal length and an automatic focusing system including a scanner optical system having a scanner means and a reference optical system wherein images of a remote subject are caused respectively to impinge on a detector means, the detector means generating an output signal representing the object distance of the subject when the images on the detector are coincident, and including means to compare and relate the orientation of said scanner system and the focus condition of the objective lens and means to set the lens opening in accordance with the available light from the subject, the improvement in a means to adjust the focus of the objective lens to the object distance comprising:

reference means on said objective lens adjustable in response to variations in focus condition of said lens and for signaling the position of said lens,

means supporting the scanner means for movement thereof,

means on said scanner supporting means for engagement with said objective lens focus condition reference means for positioning of said supporting means in response to variations in said lens,

scanner driver means for driving said scanner means oscillatably,

electronic circuit means connected to said detector means and said reference means for periodically comparing the timing of said output signals therefrom and for issuing control signals relative to the position of the subject and the position of the range of said scanner oscillation, and

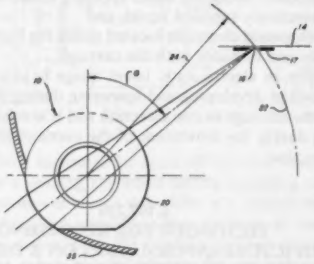
means coupled to said variable main lens and said exposure system to vary the periodicity of said comparison in accordance with the effective focal length of said main lens and the opening of said adjustable exposure system to sensitive said automatic focus adjustment in accordance with the relative condition of depth of field of said camera.

4,157,218

WIDE ANGLE SCAN CAMERA

Robert Gordon, Norwalk, and Gerard E. Boyan, Redding, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 14, 1977, Ser. No. 787,530
Int. Cl.[2] G03B *39/00, 37/00*
U.S. Cl. 354—66 **3 Claims**



1. A wide angle strip camera system which, in combination, comprises:

globe lens means:

an image-receiving surface;

curved exposure slit means disposed adjacent said image-receiving surface;

said lens means, image-receiving surface and exposure slit means being so mounted that a curved strip at a constant preselected field angle in an object field is focused on the image-receiving surface;

said system being fixedly supported in a vehicle whereby the forward velocity of the vehicle provides image motion;

said exposure slit means being curved to correspond to field

points of equal range so that there is substantially no differential image motion within the slit;

means for moving said image-receiving surface in the direction of vehicle movement at a speed corresponding to the altitude-velocity ratio of the vehicle with respect to the object field; and

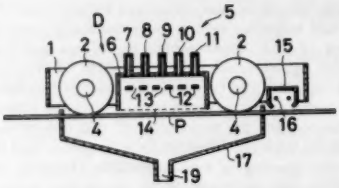
said vehicle being an aerial reconnaissance aircraft and said globe lens per se being an interface between the aircraft and the external environment.

4,157,219

MULTI-COLOR ELECTRO-STATIC IMAGE LIQUID DEVELOPMENT APPARATUS

Tatsuo Ohta, and Yoshiaki Harada, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1977, Ser. No. 809,918
Claims priority, application Japan, Jul. 10, 1976, 51-81475
Int. Cl.[2] G03G *15/10*
U.S. Cl. 355—10 **8 Claims**



1. A liquid development apparatus for developing an electro-static latent image previously formed on the surface of an image support, said apparatus comprising:

a carriage horizontally reciprocable relative to the surface;

means for applying a plurality of liquid developers and a rinse liquid mounted to the carriage;

leading and trailing rollers rotatably mounted to both sides of the carriage and in contact with the surface for squeezing the same; which pair of rollers cooperatively define a liquid receiving area on the surface therebetween;

a liquid flow regulating plate mounted to the carriage and positioned under the liquid applying means for dispersing a selectively supplied liquid; and

a development electrode located under the liquid regulating plate and movable with the carriage;

whereby an electro-static latent image is successively subjected to developing and squeezing during the movement of the carriage in one direction and it is subjected to rinsing during the movement of the carriage in the opposite direction.

4,157,220

TECHNIQUE FOR RECORDING MICROPICTURE-INFORMATION ON A DIFFRACTIVE SUBTRACTIVE FILTER EMBOSSING MASTER

Michael T. Gale, Wettswil, and Karl Knop, Zurich, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Apr. 17, 1978, Ser. No. 897,027
Int. Cl.[2] G03B *27/00, 27/02, 27/76*
U.S. Cl. 355—19 **13 Claims**

1. Apparatus useful in the fabrication of a diffractive-subtractive filter embossing master of micropicture information in a given format; said apparatus comprising:

a printing screen having a predetermined first period,

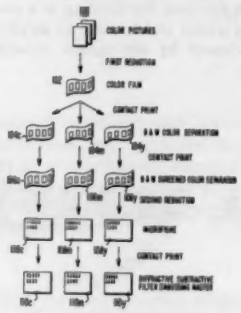
means situated on one side of said screen for illuminating said screen with diffuse light,

a reducing imaging lens situated on the other side of said screen for deriving at an image plane of said lens a screened pattern of light having a second period which is reduced by a given factor with respect to said first period, and

means situated substantially in said image plane for contact printing a continuous-tone picture medium on a high-contrast photosensitive recordng medium with said screened pattern of light.

6. A method for use in fabricating a finely-screened diffractive subtractive filter embossing master of micropicture information in a given format from a plurality of separate relatively large-size pictures which already may be screened; said method comprising the steps of:

first, recording on the same first medium all of said plurality of initially large-size pictures in a certain format in contin-



uous tone at a first reduction to a size intermediate said large size and the final size of a micropicture, said first reduction being sufficient to reduce any screening initially present in a large size picture to unresolvability at said intermediate size,

transferring in said certain format to a high-contrast medium at said intermediate size a screened image of each continuous-tone picture on said first medium, each of said screened images being transferred with a given screening period, and

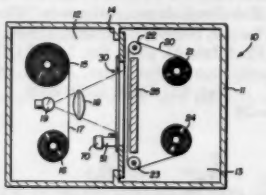
second, recording in said given format on a second medium at a second reduction to said final micropicture size each of said screened image.

4,157,221

STRIP PRINTER ADJUSTABLE MASK AND MARKER

Raymond J. Rauen, Detroit, Mich., assignor to Guardian Industries Corporation, Northville, Mich.

Filed Mar. 8, 1978, Ser. No. 884,516
Int. Cl.[2] G03B *29/00, 27/52, 27/58;* **B26D** *5/08*
U.S. Cl. 355—29 **9 Claims**



1. An adjustable length mask for a photographic strip printer which projects a light through a strip of photographic negatives, one picture negative at a time, upon an elongated strip of photographic positive sensitized paper to thus form the latent image print thereon, said mask comprising:

a flat, four sided frame formed of two opposed side strips and two opposed end strips, namely, a base end strip and a movable end strip, for overlapping the positive paper and

exposing a single print portion of the paper within the frame opening formed by the strips,

the end strips being arranged transversely to the paper strip and the two side strips being joined to the base end strip to form a U-shaped unit, with the side strips being arranged at and parallel to the opposite edges of the paper strip and being of a length greater than the length of a single print;

said movable end strip extending between and having its opposite ends slidably engaging the side strips, wherein the strips have inner edges which define the side and opposite end edges of the latent image print;

manually operable means connected between said movable end strip and an adjacent side strip for slidably moving the movable end strip between the side strips, towards and away from the base strip for adjusting the length of the frame opening, and thus, the longitudinal length of the print, movement of either the end strip or the U-shaped unit correspondingly moves the other to thereby increase and decrease the length of the latent image print without changing the location of the geometric center of the mask;

a marker means mounted upon the base strip away from the frame opening, and having a marking elememt positioned at the inner edge of the base strip for forming a mark upon the paper at the end of the print adjacent the base strip inner edge at the time that the latent image is formed.

4,157,222

DOCUMENT HOLD-DOWN COVER FOR USE IN COPYING APPARATUS

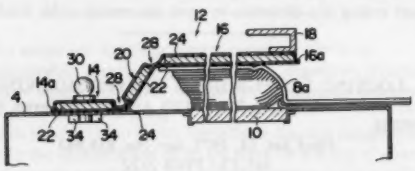
Sadao Ishihara, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 17, 1978, Ser. No. 897,212

Claims priority, application Japan, Apr. 29, 1977, 52/56150[U]; Jul. 21, 1977, 52/98158[U]

Int. Cl.² G03B *27/62*

U.S. Cl. 355—75 **20 Claims**



11. A document hold-down device for use in a copying machine comprising a relatively stiff platen, anchoring means longitudinally spaced from said platen, a sheath of a relatively flexible material substantially enveloping said platen and anchoring means and defining a hinge between said platen and anchoring means and fastening means securing said anchoring means to said copying machine.

4,157,223

SLIDING REFERENCE INTERFEROMETER

Michael L. Skolnick, Calabasas, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Oct. 28, 1977, Ser. No. 846,510

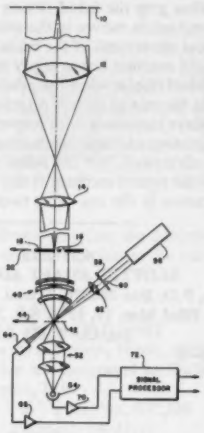
Int. Cl.² G01B *9/02*

U.S. Cl. 356—354 **10 Claims**

1. A sliding reference interferometer for measuring intensity and phase variations between adjacent points on a plane in space, said interferometer including:

means for re-imaging the plane on the surface of an opaque scanning element having a pair of apertures that produce an optical interference fringe pattern;

means for producing relative parallel movement between said aperture pair and said re-imaging plane; and



means for measuring shifts in said fringe pattern, said shifts being proportional to variations in phase between adjacent points on said plane.

4,157,224

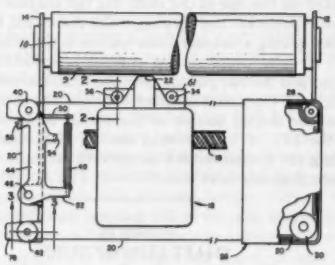
RIBBON ADVANCING MECHANISM

Alfred Z. Purzycki, Arlington Heights, and John E. Randolph, Palatine, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Aug. 5, 1977, Ser. No. 822,039

Int. Cl.² B41J *33/14*

U.S. Cl. 400—233 **7 Claims**



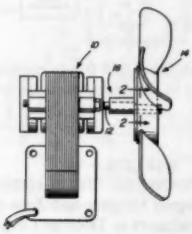
1. An improved apparatus for controlling the advance of an inked ribbon in a printing apparatus having a printing carriage mechanism that moves across the width of a record medium, having two edges, for printing indicia thereon, at least one roller rotatably mounted on the printing carriage mechanism for guiding the inked ribbon between the printing carriage mechanism and the record medium, and at least one return roller rotatably mounted near one of the two edges of the record medium for changing the direction of the inked ribbon, wherein the improvement comprises:

a one-way brake on the printing carriage roller to permit the printing carriage roller to rotate freely in one rotational direction but not in the other rotational direction so as to apply friction to and thus grip the inked ribbon when the printing carriage mechanism moves in one of its two directions but to apply minimum frictional drag on the inked ribbon as the printing carriage mechanism moves in the other of its two directions;

a one-way brake on the return roller to permit the return roller to rotate freely in one rotational direction which

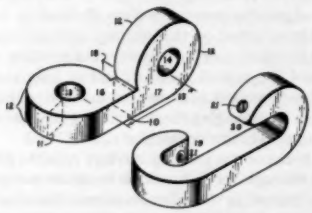
may differ from the one direction of the printing carriage roller but to prevent the return roller from rotating in the other rotational direction so as to apply maximum friction to and thus grip the inked ribbon when the printing carriage mechanism moves in the other of its two directions to prevent movement of the inked ribbon with respect to the record medium but to apply minimum frictional drag on the inked ribbon when the printing carriage mechanism moves in the one of its two directions, whereby the inked ribbon stays stationary with respect to the record medium as the printing carriage mechanism moves in the other of its two directions, but the inked ribbon moves with respect to the record medium as the printing carriage mechanism moves in the one of its two directions.

4,157,225
SLOTTED SHAFT ADAPTER
Fred Levine, P.O. Box 380876, Miami, Fla. 33138
Filed Mar. 17, 1978, Ser. No. 887,672
Int. Cl.[2] F16D *1/00*
U.S. Cl. 403—3 **7 Claims**



1. A shaft adapter for fan motors, comprising an elongated member having a pair of spaced ends, a socket provided in one of the ends, with the elongated member having a flat portion provided on the one of the ends, the flat portion communicating with the socket and forming a slot therewith, the elongated member having a circular cross section at the other of the ends which circular cross section extends longitudinally between that end and the flat portion, and the socket extending entirely through the elongated member between the ends thereof, the I.D. of the slotted section of the socket being slightly larger than the I.D. of the enclosed section of the socket, thereby enabling the slotted section to convert the basic shaft O.D. to fit more than one bore size.

4,157,226
SHAFT CONNECTORS
Eric Reiter, 301 16th Ave., San Francisco, Calif. 94118
Filed Mar. 27, 1978, Ser. No. 890,063
Int. Cl.[2] F16G *11/00*
U.S. Cl. 403—209 **2 Claims**

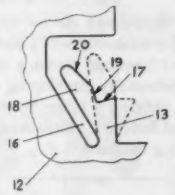


1. The geometry and proportions of a solid whose shape is defined by the outline of a square of unit length which traces over directions perpendicular to the plane of said square; first, the square traces over a circular path so as to sweep out a three-unit diameter cylinder with a one-unit diameter concentric cylindrical hole; second, the square traces tangentially from the said cylinder over a straight line for a distance of three units; third, the square traces over a second circular path in a plane perpendicular to said first circular path and also tangent to said straight line so as to sweep out a second three-unit diameter cylinder with a one-unit diameter concentric cylindrical hole; the faces of the two three-unit diameter cylinders lie in planes perpendicular to each other.

4,157,227
RESILIENT MOUNTING BUSHING
Hermann Hahle, Damme, Fed. Rep. of Germany, assignor to Lemförder Metallwaren AG, Lemförde, Fed. Rep. of Germany
Filed Jan. 23, 1978, Ser. No. 871,259
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1977, 2726676
Int. Cl.[2] F16D *1/00*; F16J *1/38*; F16B *1/00*
U.S. Cl. 403—228 **6 Claims**

1. A resilient bushing assembly, particularly for a spring mounting drive in an automobile, comprising an inner and an outer cylindrical bushing, said inner bushing being disposed within said outer bushing, an elastomer spring body interconnected between said inner and outer bushings having upper and lower spaced apart diametrically opposed axial through recesses therethrough, one of said recesses being closed slightly by loading of said bushings, and an insert of hard material inserted into only the said one of said recesses said insert acting in a direction to open the recess under load.

4,157,228
LOCKING TAB FOR HOOK-IN TYPE SHELVING
Peter G. Hammerschlag, 220 - 111th Ave. SE., Bellevue, Wash. 98004
Filed Jul. 14, 1977, Ser. No. 815,843
Int. Cl.[2] F16B *7/22*
U.S. Cl. 403—252 **6 Claims**



1. A shelving assembly comprising vertical posts of sheet metal or the like having at least one wall with a plurality of slots in said wall spaced from each other along the length of the post; horizontal beams of sheet metal or the like having a web portion and one or more hooks protruding from the ends of the webs, each of these hooks being received in one of the slots in the posts such that said beams extend transversely from said posts with said beam webs substantially perpendicular to the said walls with slots of the posts; said beam webs having in addition, extending upwards from at least one of the hooks at each end of the beams, locking tabs, these locking tabs being bendable forward into slots of the posts above the hooks, thus

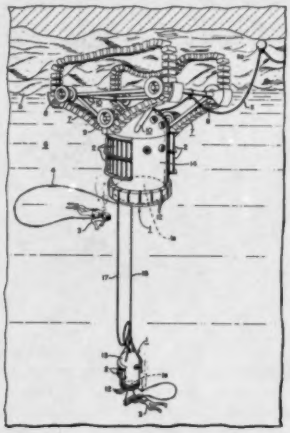
preventing the beams from being lifted upward relative to the posts and thus preventing unlocking of the hooks of the beams from the posts, these locking tabs having an upper surface that is slanted backwards and downwards from the horizontal such that this surface is substantially perpendicular with the centerline of the post after the locking tab is bent forward into the locked position.

4,157,229

UNDER-ICE TRAVELING SHELTER SYSTEM

William H. Kumm, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 13, 1977, Ser. No. 815,388
Int. Cl.[2] B63C *11/00*
U.S. Cl. 405—185 5 Claims



1. An under-ice traveling shelter system comprising,
a submersible breathing-gas-containing negatively-buoyant diver support chamber means of open-bottom construction for diver entrance,
flexible buoyant loop means for rollable traction engagement with the undersurface of an ice layer on a body of water,
a framework attached to said chamber means and extending thereabove,
roller means on said framework in support by said loop means, and
drive means operable to move said loop means past said roller means to advance said chamber means by rolling of said loop means on the ice layer undersurface.

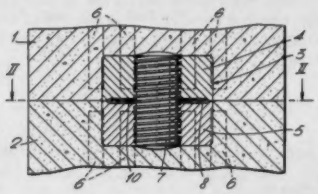
4,157,230

JOINT FOR PILE SECTIONS

Arne Tømt, Kambo, and Ivar Vamnes, Nesoddhøgda, both of Norway, assignors to B. Brynildsen & Sonner A/A, Moss, Norway

Filed May 18, 1978, Ser. No. 907,322
Claims priority, application Norway, Jun. 7, 1977, 771988
Int. Cl.[2] E02D *5/30, 5/32*
U.S. Cl. 405—252 4 Claims

1. An improved joint for pile sections, which have a nut at the ends, fastened such that one of its end surfaces is in the same plane as the end surface of the pile section, the joint being effected by a threaded bolt which engages with the nuts on two cooperating pile sections, characterized in that the nut is provided with a counterbore having radially-directed locking notches in the bottom, and in that a locking disk is seated in the counterbore, said disk having resilient locking tongues with



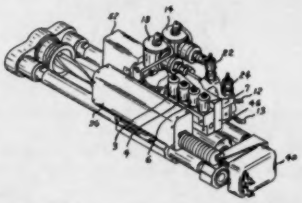
radial edges which are directed against the unscrewing direction and which engage with the notches in the nut.

4,157,231

HYDRAULIC DRILL UNIT

Joseph L. Phillips, Beaux Arts Village, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 27, 1977, Ser. No. 837,330
Int. Cl.[2] B23B *35/00, 47/18*
U.S. Cl. 408—1 R 6 Claims



1. An apparatus in combination with a drill, having a drill frame member and a drill feed housing which is movable with respect to the frame member; a system for providing a signal proportional to the net rate of travel of the drill feed housing with respect to the frame member, comprising: a linear incremental encoder, adapted to provide a predetermined number of pulses per inch of forward travel of the drill feed housing with respect to the frame member and a predetermined number of pulses per inch of reverse travel of the drill feed housing and a pulse signal indicating a substantially fully retracted position of the drill feed housing; said encoder having a linear scale secured to said drill feed housing and an encoder head secured to said frame member; a first frequency to voltage converter, responsive to pulses related to forward travel of said feed housing; a second frequency to voltage converter, responsive to pulses related to reverse travel of said feed housing; means for inverting the output of one of said frequency to voltage converters; a first summing circuit; means for connecting the inverted output of said one frequency to voltage converter to said summing circuit; means for connecting the output of the other frequency to voltage converter to said summing circuit to provide a signal proportional to net feed rate of the drill feed housing with respect to the drill frame member.

6. The method of drilling through a multi-material stack with a hydraulic drill, comprising: controlling the forward and reverse movements of a drill with a hydraulic feed cylinder; measuring the forward and reverse movements of the hydraulic drill feed cylinder with a linear encoder; subtracting a signal proportional to the reverse movement from a signal proportional to the forward movement to obtain a net feed rate signal; comparing the net feed rate signal with a common feed rate signal proportional to the desired feed rate for each material in the stack, to obtain an error signal; controlling the rotation of the drill with a hydraulic spindle motor; measuring the hydraulic spindle speed with a slotted spindle and a magnetic pickup; comparing a signal proportional to spindle speed signal ob-

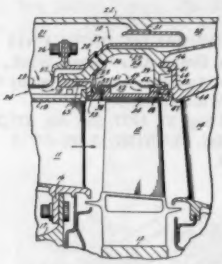
tained from said magnetic pickup with a command speed signal proportional to the desired speeds for the materials in the stack measuring the differential pressure across the feed piston to obtain a signal proportional to thrust; measuring the differential pressure across the spindle drive to obtain a signal proportional to torque, retracting the drill in response to an increase in thrust or torque, above predetermined levels.

4,157,232

TURBINE SHROUD SUPPORT

Melvin Bobo, Cincinnati, and Charles F. Riedmiller, Greenhills, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 31, 1977, Ser. No. 846,956
Int. Cl.[2] F02C *7/18*
U.S. Cl. 415—116 **11 Claims**



1. In a turbomachine of the type having in adjacent serial flow relationship a turbine shroud and a vane outer band collectively defining a portion of the outer flow path for the motive fluid, an improved sealing and support arrangement comprising:

(a) an annular slot formed in the rear edge of the shroud;

(b) a nozzle support structure disposed radially outside of and having an inner flange in engagement with a radially outer surface of the shroud, and said support structure further having an outer annular support flange; and

(c) a C-clamp attached to the vane outer band, said C-clamp comprising integrally connected outer and inner flanges, said inner flange extending axially forward into said shroud annular slot and said outer flange extending axially forward in overlapping relationship with said outer annular support flange so as to jointly clamp the shroud to said nozzle support structure.

4,157,233

VARIABLE DELIVERY HYDRAULIC PUMP

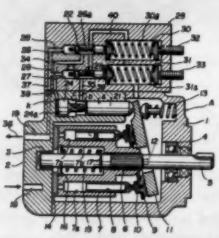
Takeshi Horiuchi, Ibaraki, Japan, assignor to Daikin Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 700,953, Jun. 29, 1976, Pat. No. 4,072,442. This application Nov. 18, 1977, Ser. No. 852,732
Claims priority, application Japan, Jul. 4, 1975, 50/82871; Mar. 15, 1976, 51/28458; Apr. 6, 1976, 51/38904
Int. Cl.[2] F01B *1/26*
U.S. Cl. 417—218 **26 Claims**

1. In a variable delivery hydraulic pump including a housing having a suction conduit and a discharge conduit, a variable control element movable between maximum and minimum displacement positions corresponding, respectively, to a maximum and a minimum fluid discharge amount, a pumping means associated with said variable control element and controlled thereby to vary the fluid discharge amount of said pumping means between said maximum and minimum amount, the improvement comprising:

a biasing means for constantly urging said variable control element toward said maximum displacement position, a pilot plunger means and a control plunger means for adjusting said displacement position of said variable control element from said maximum to said minimum against the urging of said biasing means, said pilot plunger means having a rear end and being slidable through a limited stroke distance to thereby move said variable control element from said maximum displacement position to an intermediate displacement position between said maximum and minimum positions, to vary said fluid discharge amount from said maximum amount to a medium amount, said control plunger means having a rear end and being slidable through a stroke distance to move said variable control element from said intermediate displacement position to said minimum displacement position to vary said fluid discharge amount from said medium amount to said minimum amount,

means for controlling the sliding movement of said pilot and control plunger means including first and second spool valves each disposed for axial movement in first and second spool chambers, respectively, each spool chamber having one end thereof connected to directional control valve means, a high pressure conduit connected to said discharge conduit of said pumping means and to said directional control valve means, so that one or the other of



said spool valves will be selectively exposed to the fluid discharge pressure of said pumping means, first and second push members disposed at the other ends of said first and second spool chambers for engaging the ends, respectively, of said first and second spool valves for urging said spool valves against the fluid discharge pressure from said discharge conduit, a first control conduit and a second control conduit, said second control conduit establishing fluid communication between a point intermediate the ends of said second spool chamber and said rear end of said control plunger, said first control conduit establishing fluid communication between a point intermediate the said ends of said first spool chamber and said second control conduit, a conduit connecting the rear of said pilot plunger means to said directional control valve means, said first and second push members exerting selected biasing forces on said respective spool valves so that said spool valves will each be caused to move against said respective push members in response to selected fluid discharge pressures whereby two flow rates may be obtained under selected pressures by selective control of said directional control valve means.

4,157,234

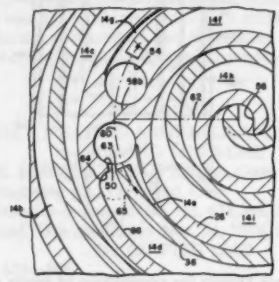
SCROLL-TYPE TWO STAGE POSITIVE FLUID DISPLACEMENT APPARATUS

H. William Weaver, and Robert W. Shaffer, both of Campbellsville, Ky., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 824,749, Aug. 15, 1977. This application Sep. 21, 1978, Ser. No. 944,602
Int. Cl.[2] F04C *23/00, 17/02*
U.S. Cl. 418—6 **3 Claims**

1. An improved, scroll-type, positive fluid displacement apparatus, having means defining a circular and peripherally-walled, fluid-working chamber, a pair of scroll-shaped, fluid-working elements within said chamber, a first port opening

into and substantially centrally of said chamber, a second port opening into said chamber radially outwardly spaced from said first port, and means mounting at least one of said scroll-shaped, fluid-working elements for orbital movement thereof in said chamber, and interfittingly with the other of said scroll-shaped, fluid-working elements, to effect moving line contacts between said elements which define walled, variable-volume, fluid-confining pockets for conducting fluid between said first and second ports, wherein said other fluid-working element defines a scroll-shaped channel in said chamber, said channel having radially inner, outer, and intermediate, arcuate portions thereof disposed in immediate, radial juxtaposition, said inner, arcuate portion being defined by substantially parallel, first and second sections of said other element, said outer, arcuate portion being defined by substantially parallel, third and fourth sections of said other element, and said intermediate, arcuate portion being defined by said second and third sections of said



other element, and said inner and outer channel portions being in direct and open, fluid communication with said intermediate portion thereof, and together with said intermediate portion defining open, unobstructed areas of said channel in which said one, scroll-shaped element in freely and operatively movable, wherein the improvement comprises:

means bridging across said channel, joining only said second and third sections of said other element, and defining a fluid-interrupting wall in traverse of only said intermediate portion of said channel for preventing fluid communication between said inner and outer, arcuate portions of said channel; and

fluid venting and fluid reentry means opening internally and externally of said chambers, in immediate adjacency to said fluid-interrupting wall for effecting a fluid communication between said inner and outer arcuate portions of said channel in bypass or shunting avoidance of said wall.

4,157,235

DEVICE FOR MODIFYING THE THICKNESS OF A BODY EXTRUDED AT A CONSTANT RATE

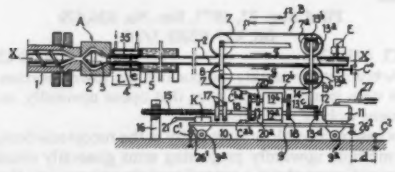
André E. R. Lagabe, Toul, and Bernard A. Prevotat, Foug, both of France, assignors to Pont-a-Mousson S.A., Nancy, France

Filed Jul. 21, 1977, Ser. No. 817,648

Claims priority, application France, Jul. 30, 1976, 76 23457; Jun. 10, 1977, 77 17902

Int. Cl.² B29D *23/04*

U.S. Cl. 425—71 **12 Claims**



1. An installation for extruding a body, and in particular a tube of thermoplastic material having a variable thickness, comprising a: constant-output extruder, a cold calibrating die head adjacent the extruder for sizing the exterior of the extruded body issuing from the extruder, a cooling tank adjoining the cold die head for cooling the extruded body issuing from the cold calibrating die head, and a drawing machine which is located downstream of the cooling tank relative to the flow of thermoplastic material, said drawing machine comprising a plurality of rolling means rotatable about axes for rolling by friction on the extruded body and arranged around a section of the body, a frame movable in a to-and-fro manner in a direction perpendicular to said axes of rotation of the rolling means, the extruder and the drawing machine constituting two elements one of which elements is carried by the frame, means operatively associated with the rolling means for driving the rolling means at a constant speed, and means operatively associated with the frame for driving the frame in said direction.

4,157,236

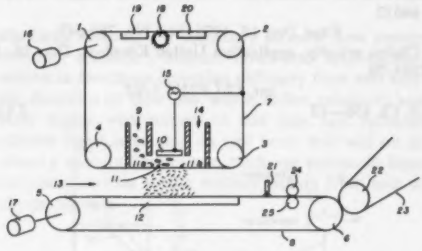
ELECTROSTATIC DRY FORMER

Leroy H. Busker, Rockton, Ill., and Henry P. Sheng, Youngstown, Ohio, assignors to Beloit Corporation, Beloit, Wis.

Filed Feb. 28, 1977, Ser. No. 772,753

Int. Cl.² B29C *23/00*

U.S. Cl. 425—174.8 E **11 Claims**



1. An apparatus for forming a web from fiber flocs comprising, in combination:

a screening member having inside and outside surfaces;

means operatively associated with the inside surface of the screening member for depositing fiber flocs on the screening member;

means operatively associated with the inside surface of the screening member for generating an oscillating electrostatic field around the screening member for mechanically agitating the fiber flocs to remove individual fibers therethrough;

a forming member spaced apart relative to the outside surface of the screening member and positioned to receive individual fibers passing through the screening member; and

means operatively associated with the forming member for attracting thereto the individual fibers removed through the screening member to thereby facilitate the dry formation of a uniform, nonwoven web.

4,157,237

MOLDING ELEMENT FOR PRODUCING THERMOPLASTIC FILM

Garland E. Raley, Terre Haute, Ind., assignor to Ethyl Corporation, Richmond, Va.

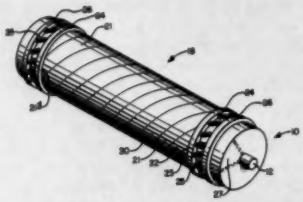
Filed Jul. 10, 1978, Ser. No. 922,990

Int. Cl.² A01J *21/00*

U.S. Cl. 425—363 **14 Claims**

1. A rotatable perforated molding element means for embossing and/or perforating thermoplastic sheet or film comprising a series of perforated strip means having two parallel sides and two parallel ends, said strip means being adapted for

wrapping about a drum means for supporting said strips in a manner such that said ends of said strip means lie in a plane



generally perpendicular to the axis of rotation of said molding element means and said sides of adjacent strip means contact each other.

4,157,238

CONTROL SYSTEM FOR COMBUSTION APPARATUS AND METHOD

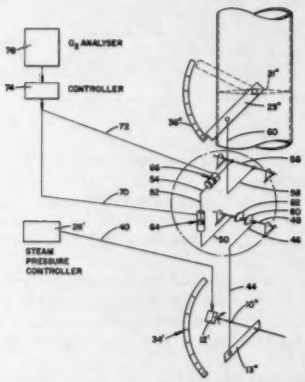
Robert A. van Berkum, 117 Fernwood Rd., Chagrin Falls, Ohio 44022

Filed Dec. 15, 1976, Ser. No. 750,647

Claims priority, application United Kingdom, Dec. 16, 1975, 51385/75

Int. Cl.[2] F23H *1/02*

U.S. Cl. 431—12 **2 Claims**



1. A method of controlling the operation of combustion apparatus having at least two flow control devices operated in a calibrated relationship by actuation means responsive to a first control signal, said method comprising the steps of:

(a) providing variable means between at least one of said flow control devices and said actuation means, the actuation of said variable means causing the calibrated relationship of said flow control devices to be changed in such a way that the change in the ratio of the two flows remains substantially constant throughout the operating range of the combustion apparatus from minimum to maximum flow;

(b) sensing combustion conditions in said combustion apparatus and generating a second control signal;

(c) conducting said second control signal to said variable means; whereby,

the calibrated relationship of said flow control devices is altered by a fixed percentage in response to said second control signal.

4,157,239

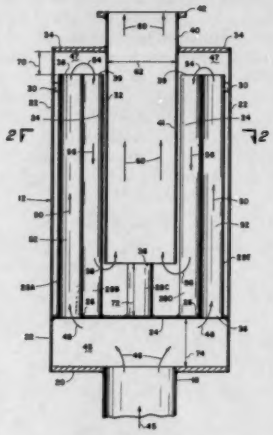
MOLECULAR SEAL IMPROVEMENT ACTION

Robert D. Reed, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Jul. 21, 1977, Ser. No. 817,548

Int. Cl.[2] F23L *17/02*

U.S. Cl. 431—202 **1 Claim**



1. In a flare stack system for combustion of waste gases, an improved molecular seal, for installation at an intermediate point in the flare stack system, comprising;

(a) a cylindrical housing of significantly larger diameter than said flare stack, said housing closed by annular plates to the flare stack at the top and at the bottom, a vertical pipe of the same diameter as the flare stack extends downwardly a first selected depth into said housing creating an annular space therebetween;

(b) at a second selected depth below the bottom of said vertical pipe a bulkhead extends across and seals the complete cross-section of said housing creating a plenum between said bottom annular plate and said bulkhead;

(c) a plurality of openings in said bulkhead near the outer perimeter thereof, each opening having a vertical welded tube therein, said tubes extending upwardly into said annular space to within a third selected distance of the top annular plate of said housing;

the dimension of the contained volume of the cylindrical housing less the volume of said vertical pipe and the total volume of said vertical tubes being greater than the total volume of said vertical tubes, whereby said waste gases flow up said stack into said plenum, up through said vertical tubes into said annular space, thence down through said annular space, thence upwardly through said vertical pipe to said stack.

4,157,240

CANDLE SUPPORT BRACKET

Robert S. Wallace, 823 S. Longwood Ave., Los Angeles, Calif. 90005

Filed Aug. 22, 1977, Ser. No. 826,479

Int. Cl.[2] F23D *3/16*

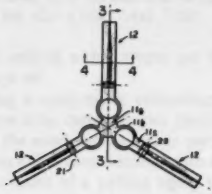
U.S. Cl. 431—297 **8 Claims**

1. A bracket for snugly supporting the lower portion of a candle stem in a receptacle bore that opens upwardly, to prevent stem wobble, comprising

(a) a base receivable downwardly in the receptacle bore, and

(b) multiple upwardly projecting arms generally circularly spaced apart about a central upright axis passing through the center of the base, the arms carried by the base to be deflected by the receptacle bore relatively inwardly

toward and into variable snug engagement with said stem lower portion, as the candle lower portion is inserted into said bore, the base being perforate between the center of the base and the lower end of each arm,



(c) said arms defining elongated projections extending relatively inwardly toward the candle stem lower portion to bite into the candle was as the arms are relatively inwardly deflected, as described, said projections extending lengthwise of said arms, and having sharp inwardly facing edges.

4,157,241

FURNACE HEATING ASSEMBLY AND METHOD OF MAKING THE SAME

Wayne H. Samuelson, Bedford Heights, Ohio, assignor to Avion Manufacturing Co., Cleveland, Ohio

Continuation-in-part of Ser. No. 671,285, Mar. 29, 1976, abandoned. This application Nov. 24, 1976, Ser. No. 744,509

Int. Cl.[2] **F23D** *15/02*

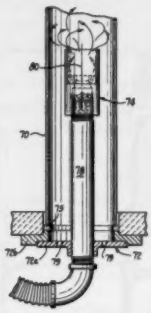
U.S. Cl. 431—353 **21 Claims**

1. A burner for maintaining combustion of a gaseous fuel-air mixture in a heat transmitting tube, said burner comprising a burner body defining:

(a) a throat section providing a primary mixture flow passage;

(b) a mixture discharge section defining a discharge opening, said discharge section defined by a surrounding body wall configured to direct said mixture into said heat transmitting tube via said discharge opening along and about a line defining a central axis of said body wall, said discharge section and discharge opening having flow areas which are larger than the flow area of said throat section; and,

(c) a plurality of secondary mixture flow passages bypassing at least part of said throat section and opening into said



discharge section, said secondary mixture flow passages directing secondary mixture flows into said discharge section in directions diverging obliquely from said axis in the direction of flow and which define relatively small skew angles with respect to said axis, said secondary mixture flows impinging on said body wall and on said primary mixture flow in said discharge section to impart vorticular motion to the mixture issuing from said discharge opening.

4,157,242

THIXOTROPIC GEL FUELS AND METHOD OF MAKING THE SAME

William B. Tarpley, Jr., West Chester, Pa., assignor to Energy and Minerals Research Co., Kennett Square, Pa.

Filed Dec. 5, 1977, Ser. No. 857,326
Int. Cl.[2] C10L *7/00, 7/02*
U.S. Cl. 44—7 D 26 Claims

1. A method of making a thixotropic gel fuel composition comprising the steps of:

(a) first absorbing a combustion enhancing material in the pores of porous solid carboniferous particles; and

(b) then mixing the solid carboniferous particles containing the combustion enhancing material with a liquid fuel and an effective amount of a gelling agent to form a stable thixotropic gel composition having a solid-like immobility at rest wherein the solid carboniferous particles containing the combustion enhancing material from about 5 to about 75 volume percent of the composition.

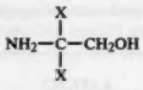
4,157,243

ADDITIVE USEFUL IN OLEAGINOUS COMPOSITIONS

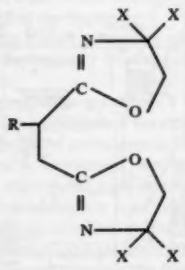
Jack Ryer, East Brunswick; Harold N. Miller, Millington; James Zielinski, Somerset, all of N.J., and Stanley J. Brois, Wantage, England, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 710,279, Jul. 30, 1976, which is a continuation of Ser. No. 530,235, Dec. 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 455,250, Mar. 27, 1974, abandoned. This application Jun. 19, 1978, Ser. No. 917,323
Int. Cl.[2] C10L *1/22*
U.S. Cl. 44—63 5 Claims

1. A petroleum fuel composition comprising: a major amount of petroleum fuel and in the range of 0.001 to 0.5 wt. % of bis-oxazoline of a molar proportion of a hydrocarbon-substituted C_4-C_{10} mono unsaturated dicarboxylic acid material selected from the group consisting of dicarboxylic acid, ester and anhydrides thereof, having in the range of from about 8 to 49 carbon atoms in said hydrocarbon substituent; reacted with about two molar proportions of a 2,2-disubstituted-2-amino-1-alkanol having 2 to 3 hydroxy groups and containing a total of 4 to 8 carbons of the formula:



wherein X is alkyl or hydroxy alkyl, said alkyl groups having 1 to 3 carbon atoms, and at least one of said X is a hydroxy alkyl group of the structure $-(CH_2)_nOH$ where n is 1 to 3; at a temperature in the range of about 140 to 240° C. for about ½ to 24 hours with the removal of about three molar proportions of water to thereby produce said bis-oxazoline having the structure



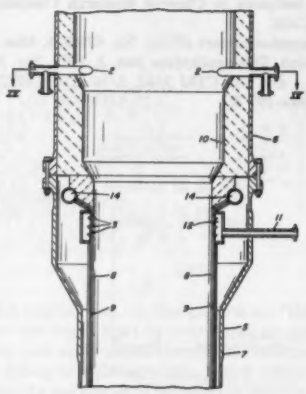
wherein R is said hydrocarbon substituent and X is as defined above.

4,157,244

GAS-COOLING METHOD AND APPARATUS

Paul Gernhardt, Bochum; Wolfgang Grams, Herne; Wilhelm Danguillier, and Siegfried Pohl, both of Bochum, all of Fed. Rep. of Germany, assignors to Dr. C. Otto & Comp. GmbH., Bochum and Saarbergwerke A.C., Saarbrucken, both of, Fed. Rep. of Germany; a part interest to each

Filed Mar. 8, 1978, Ser. No. 884,677
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710154
Int. Cl.[2] B01J *3/00*
U.S. Cl. 48—62 R 12 Claims



1. Gas-cooling apparatus for a high temperature gas generator, the combination including:

a cylindrical pressure shell forming a vertical shaft to conduct a stream of hot primary gas throughout a gasification region extending vertically to a superimposed after-gasification region which communicates with an adjacent cooling region thereabove, said pressure shell having a wall carrying a lining of cooling tubes surrounding a vertical and substantially cylindrical reactor shaft within said shell for extending along said gasification region and said after-gasification region,

tangential gas injection nozzles carried in the upper cooling region by the wall of said pressure shell to inject cooling gas tangentially into the high temperature gas conducted by said reactor shaft, and

gas-cooling injection nozzles below said tangential gas injection nozzles in said after-gasification region, said gas cooling injection nozzles being constructed to inject partial streams of cooling gas to penetrate into the hot stream of primary gas toward the vertical axis of said reactor shaft to constrain the hot stream of primary gas laden with dust rising from the gasifier region toward the vertical axis of the reactor shaft.

10. A method of cooling hot primary gas in a high temperature gas generator, the steps including:

conducting a stream of hot primary gas upwardly from a gasification region into a superimposed after-gasification region and thence into an adjacent cooling region thereabove, the stream of hot primary gas passing in succession along a vertical and substantially cylindrical reactor shaft through said regions,

arranging cooling tubes to form a lining to surround the cylindrical reactor shaft along said gasification region and said after-gasification region,

withdrawing primary gas from the cooling region,

purifying the withdrawn primary gas,

cooling the withdrawn primary gas,

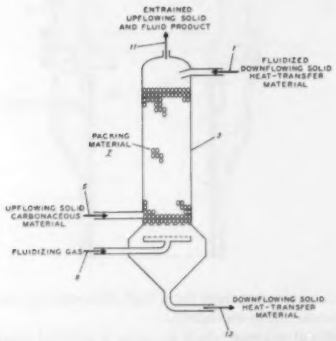
feeding the purified and cooled primary gas through nozzles tangentially into the stream of hot primary gas in said cooling region, and

feeding partial streams of purified and cooled primary gas in said after-gasification region through nozzles disposed below the tangentially-arranged nozzles into the stream of hot primary gas to constrict the stream of hot primary gas laden with dust rising from the gasification region toward the central vertical axis of said cylindrical reactor shaft.

4,157,245
COUNTERCURRENT PLUG-LIKE FLOW OF TWO SOLIDS

David S. Mitchell, and David R. Sageman, both of San Rafael, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 670,925, Mar. 26, 1976, abandoned. This application Jun. 3, 1977, Ser. No. 802,999
Int. Cl.[2] C10J *3/46, 3/54;* C10B *49/22*
U.S. Cl. 48—197 R 33 Claims



1. A process for gasifying a solid carbonaceous material in a vertically elongated vessel, said vessel including means for substantially impeding vertical back mixing of vertically moving solids substantially throughout said vessel, which comprises:

(1) introducing into an upper portion of said vessel a first particulate solid comprising a solid heat-transfer material;

(2) introducing into a lower portion of said vessel a second particulate solid comprising a solid carbonaceous material, the physical characteristics of said first solid and second solid differing such that a superficial velocity of a fluid flowing upwardly through said vessel is greater than the minimum fluidizing velocity of said first solid and less than the terminal velocity of said first solid while said superficial velocity is greater than the terminal velocity of said second solid;

(3) maintaining substantially countercurrent vertical flow of said first and second solids in said vessel without substantial top-to-bottom back mixing of said first and second solids in said vessel by passing a reactive gas stream including a reactive component upwardly through said vessel at a rate sufficient to fluidize said first solid and entrain said second solid and forming a fluid product and an at least partially gasified solid carbonaceous material by reacting said second solid with said reactive component, whereby said first solid substantially flows downwardly in a fluidized state through said vessel and said second solid substantially flows upwardly in an entrained state through said vessel, and said first and second solids pass through said vessel in countercurrent plug flow;

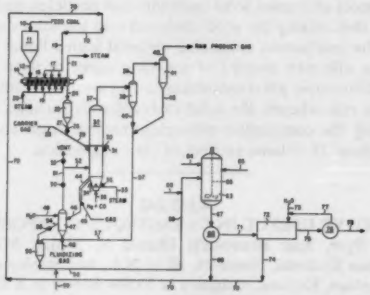
(4) removing from a lower end of said vessel said heat-transfer material at a temperature substantially different from the temperature at which said heat-transfer material was introduced into said vessel; and

(5) removing from an upper end of said vessel said product fluid and said at least partially gasified solid.

4,157,246
HYDROTHERMAL ALKALI METAL CATALYST RECOVERY PROCESS

James M. Eakman, Houston, and LeRoy R. Clavenna, Baytown, both of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 27, 1978, Ser. No. 872,859
Int. Cl.[2] C10J *3/06;* C10D *5/02*
U.S. Cl. 48—197 R 15 Claims



1. In a process for the conversion of a solid carbonaceous feed material in the presence of an alkali metal-containing catalyst into liquids and/or gases wherein particles containing alkali metal residues are produced, the improvement which comprises:

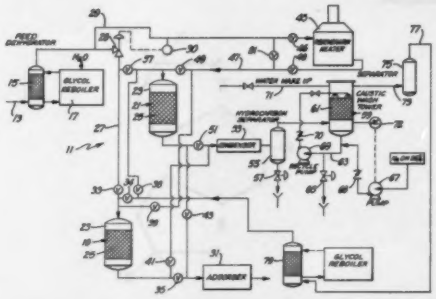
(a) treating said particles containing said alkali metal residues in a reaction zone with a calcium or magnesium-containing compound in the presence of liquid water at a temperature between about 250° F. and about 700° F. and in the presence of added carbon monoxide thereby converting water insoluble alkali metal constituents in said residues into water soluble alkali metal formates and producing an aqueous solution containing water soluble alkali metal constituents consisting primarily of alkali metal formates; and

(b) using said alkali metal constituents from said aqueous solution in said conversion process as at least a portion of the alkali metal constituents comprising said alkali metal-containing catalyst.

4,157,247
CORROSION CONTROL PROCESS

Robert H. Collins, III, Beverly Hills, Calif., and Donald L. Love, Tulsa, Okla., assignors to Reserve Synthetic Fuels, Inc., Signal Hill, Calif.; a part interest

Filed Oct. 31, 1977, Ser. No. 847,092
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—31 17 Claims



1. A corrosion control process for a gaseous stream which contains water, an impurity, and a product gas wherein the

impurity includes a halogenated hydrocarbon, said process comprising:

removing water from the gaseous stream to provide a substantially dehydrated gaseous stream;

introducing the dehydrated gaseous stream to an adsorption zone to adsorb at least some of the halogenated hydrocarbon of the impurity from the dehydrated gaseous stream to provide a nonadsorbed component which includes the product gas;

said step of removing water including removing a sufficient amount of the water so that substantially no water is adsorbed from the dehydrated gaseous stream in said adsorption zone;

terminating said step of introducing;

passing a hot regeneration gas through the adsorption zone to remove the adsorbed halogenated hydrocarbon from the adsorption zone to thereby thermally regenerate the adsorption zone with the heat from the hot regeneration gas cracking the halogenated hydrocarbon to produce a gaseous impurity component containing hydrogen and at least one halogen; and

removing the gaseous impurity component from the regeneration gas;

thereby, substantially preventing corrosion as a result of the cracking of the halogenated hydrocarbon.

12. A corrosion control process for a landfill gas which contains water, an impurity, and methane wherein the impurity includes a first component and a chlorinated hydrocarbon, said process comprising:

providing at least first and second adsorption zones each of which has an inlet and an outlet and includes adsorbent material capable of selectively adsorbing the chlorinated hydrocarbon;

removing at least some of the water from the landfill gas to provide substantially dehydrated landfill gas;

introducing the dehydrated landfill gas into the inlet of the first adsorption zone and contacting the dehydrated landfill gas with the adsorbent material of the first adsorption zone to adsorb the chlorinated hydrocarbon to provide a gas stream containing methane and said first component of the impurity;

said step of removing water including removing a sufficient amount of water from the landfill gas so that substantially no water is adsorbed from the landfill gas in said first adsorption zone;

discharging the gas stream containing methane and the first component of the impurity from the outlet of said first adsorption zone;

terminating the introduction of the dehydrated landfill gas into the inlet of the first adsorption zone;

introducing the dehydrated landfill gas into the inlet of the second adsorption zone to adsorb the chlorinated hydrocarbon in the adsorbent material of the second adsorption zone to provide a gas stream containing methane and said first component of the impurity;

discharging the gas stream containing methane and the first component of the impurity from the outlet of the second adsorption zone;

passing a hot regeneration gas through the first adsorption zone during at least a portion of the time that the introduction of the dehydrated gas stream to the inlet of said first adsorption zone is terminated, the hot regeneration gas desorbing the chlorinated hydrocarbon to thermally regenerate the first adsorption zone with the heat from the hot regeneration gas cracking at least some of the chlorinated hydrocarbon to provide hydrogen chloride gas; and

removing the hydrogen chloride gas from the regeneration gas at a location outside of the first adsorption zone;

thereby, substantially preventing corrosion as a result of the cracking of the chlorinated hydrocarbon.

4,157,248

METHOD FOR TREATING GASEOUS NUCLIDES AND GAS SYSTEM FOR VENTILATING TANKS CONTAINING RADIOACTIVE LIQUID

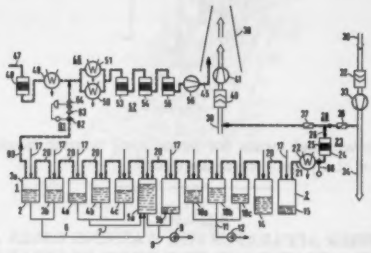
Horst Queiser, Maintal, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim (Ruhr), Fed. Rep. of Germany

Filed Feb. 14, 1977, Ser. No. 768,499

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2608162

Int. Cl.² B01D *53/00*

U.S. Cl. 55—66 **14 Claims**



1. Method for treating and venting gaseous nuclides in the gas space above the liquid level in tanks under normal liquid level conditions and under rapid fluctuations in liquid level resulting from filling or draining a tank, which comprises

(a) connecting the gas spaces of the tanks to provide a chain of tanks with the gas space in the tank at one end of the chain in communication with the gas space in the tank at the other end of the chain through the intermediate gas spaces in the other tanks in the chain,

(b) normally discharging limited amounts of gas from said gas spaces at said first end of the chain into a waste gas system and stack,

(c) discharging gas in said gas spaces which exceed said normally limited amounts of gas as a result of filling a tank with liquid, from said gas space at said other end of the chain to a stack, and

(d) when liquid is drained from a tank thereby creating a void, introducing inert gas into said gas space at said other end of the chain to fill said void.

4,157,249

SUCTION DEVICE FOR THE WET EXTRACTION OF DUST

Gerald Namy, Saint-Etienne, France, assignor to Creusot-Loire Enterprises, Paris, France

Continuation of Ser. No. 744,744, Nov. 24, 1976, abandoned. This application Apr. 20, 1978, Ser. No. 898,844

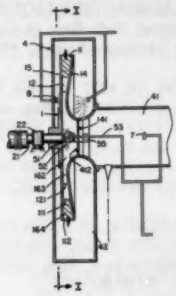
Claims priority, application France, Nov. 18, 1975, 75 36616; Nov. 23, 1976, 76 35177

Int. Cl.² B01D *47/00*

U.S. Cl. 55—230 **3 Claims**

1. A suction apparatus for wet extraction of dust from a gas laden with dust comprising: a fan volute provided with an opening and a delivery duct; a rotor adapted to be driven around an axis of revolution, being provided with a first side cheek and a second side cheek operating to form an inlet opening central thereof disposed in proximity to said opening of said volute and being coaxial with the said axis, at least one of the side cheeks being profiled from said inlet opening to define respectively, a convergent position, a neck portion, a divergent portion, said neck and divergent portions ending at the periphery, said side cheeks increasing in distance from the said neck to the said periphery, and at least two sets of radial blades provided between said side cheeks with the members of each set being arranged at equal distances of said axis to thereby form a first crown and an outer second crown and each trailing

edge of said blade of said inner crown being offset angularly with respect to the leading edge of an adjacent blade of the



outer crown; and means for introducing wetting liquid into said rotor at a point central thereof.

4,157,250

SCRUBBER APPARATUS FOR WASHING GASES AND HAVING A COARSE AND FINE DROPLET SEPARATOR

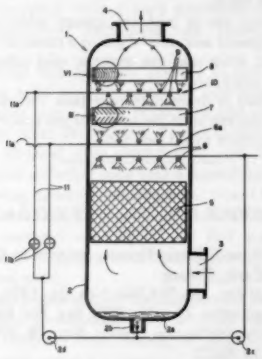
Ulrich Regehr, Süsterfeldstrasse 65, D-51 Aachen, Fed. Rep. of Germany, and Siegfried Bulang, Kerkrade, Netherlands, assignors to Ulrich Regehr, Aachen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 847,671, Nov. 1, 1977, abandoned, which is a continuation of Ser. No. 557,130, Mar. 10, 1975, abandoned, which is a continuation of Ser. No. 396,793, Sep. 13, 1973, abandoned. This application Mar. 23, 1978, Ser. No. 889,565

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1972, 2246474

Int. Cl.[2] B01D *47/14*

U.S. Cl. 55—233 **10 Claims**



1. A washing apparatus for removing particulates or soluble components from a gas stream, comprising:

an upwardly elongated tower formed with an inlet at the bottom portion thereof for admitting gas to said tower and an outlet at a top portion thereof for discharging clean gas;

filling means in said tower above said inlet and traversed by gas rising from said inlet;

spray means in said tower above said filling means for washing the gas rising within said filling means;

a coarse separator spaced above said filling means and between said spray means and said outlet for removing droplets from the gas emerging from said filling means, said coarse separator comprising a plurality of mutually parallel horizontally spaced vertical partitions defining respective flow chambers between them, each of said flow chambers being provided with a lower row of mutually parallel spaced-apart inclined plates spanned between the partitions defining the respective chamber, and an upper row of correspondingly spaced oppositely inclined plates spanned between the partitions of the respective chamber, the lower edge of each plate of the upper row lying between upper edges of plates of the lower row; and

a fine separator spaced above said coarse separator in said tower between said spray means and said outlet, said fine separator comprising a plurality of horizontally spaced mutually parallel vertical partitions defining respective flow chambers between them, and a row of geometrically similar baffle plates spanned between the partitions of each of the chambers of said fine separator, said baffle plates each having a pair of oppositely inclined portions and being spaced apart by a distance of approximately half the spacing between the plates of each row of said coarse separator, each of said baffle plates being formed with an array of chevron-shaped corrugations converging upwardly and having the vertices lying in the vertical median plane of the respective chamber of said fine separator, said corrugations of each baffle plate terminating inwardly of the partitions of the respective chamber of said fine separator to form adjacent the latter partitions respective run-off zones of each baffle plate, said separators being constructed and arranged such that the flow velocity of the gas in said fine separator is substantially 1.5 times the velocity of the gas in said coarse separator.

4,157,251

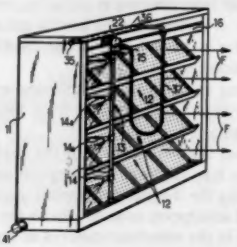
SELF-CLEANING FILTER DEVICE

Pierre Colomer, Chatenay-Malabry, France, assignor to Interfiltre, S. A., Livarot, France

Filed Jan. 6, 1978, Ser. No. 867,471

Int. Cl.[2] B01D *45/18*

U.S. Cl. 55—242 **6 Claims**



1. A self-cleaning filter device comprising a filter panel supported in a frame;

spray means extending substantially across the filterpanel including a spray pipe connected to a cleaning liquid distributing system;

traveller means mounted on a rail support extending substantially across the filter panel, the spray means being supported by the traveller means for movement across the filter panel; and

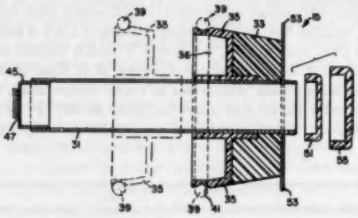
drive means for moving the traveller means on the rail support comprising a hydraulic motor inserted in series with the liquid circuit of the cleaning liquid distributing system whereby the traveller means moves on the rail support, due to the cleaning liquid passing through the hydraulic motor.

4,157,252

DEVICE FOR FORMING DEMONSTRATION CLEANING-TEST BAGS AND FOR ATTACHING THE SAME TO VACUUM CLEANERS

Thomas E. Baird, 2132 N. 24th St., Springfield, Ill. 62702

Filed Nov. 10, 1976, Ser. No. 740,762
Int. Cl.[2] B01D *35/02*
U.S. Cl. 55—374 10 Claims



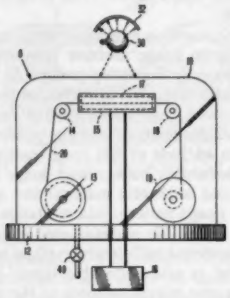
1. A device for forming a demonstration cleaning-test bag and for attaching it to a vacuum sweeper, comprising: an elongated tubular element including means for attaching one end thereof sealingly to the air-discharge port of a vacuum cleaner, an elongated plunger member insertable axially into the other end of said tubular element for pushing the center of a flexible filter lamina into said tubular element, said plunger having an annular portion of a diameter greater than the diameter of said tubular element and having a circumferentially disposed seat for holding a stretched band positioned for axial movement therefrom over and onto the margin of a filter lamina, when said lamina is folded forwardly over said other end of said tubular element prior to plunger withdrawal, to anchor the bag thus-formed to said tubular element.

4,157,253

METHOD OF REDUCING ABSORPTION LOSSES IN FUSED QUARTZ AND FUSED SILICA OPTICAL FIBERS

Karl G. Hernqvist, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 23, 1978, Ser. No. 918,655
Int. Cl.[2] C03B *37/00*
U.S. Cl. 65—2 5 Claims



1. A method of reducing absorption losses in an optical fiber comprising:

heating an optical fiber selected from the group consisting of fused quartz and fused silica, to from about 500° C. to about 1500° C. under a pressure of from about 1×10^{-2} to about 1×10^{-10} torr; and

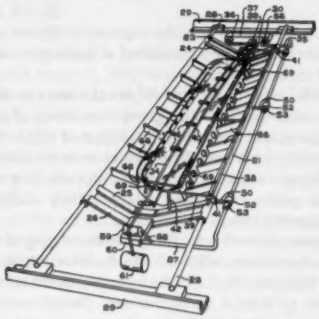
irradiating said optical fiber with ultraviolet radiation in the wavelength range of from about 3000 to about 4000 angstroms for a sufficient time to dissociate the hydroxyl radicals contained in the optical fiber.

4,157,254

METHOD AND APPARATUS FOR BENDING GLASS SHEETS TO CURVED V-BENDS

Dean L. Thomas, Glenshaw, and Thomas J. Reese, Sarver, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 3, 1978, Ser. No. 892,626
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—273 4 Claims



1. Apparatus for producing a curved line of sharp bending across a heat-softened glass sheet, along which line the radius of curvature is no more than 8 inches, comprising:

a bending mold including upwardly facing shaping surfaces defining the desired contour for the bent glass sheet, the uppermost extremities of the shaping surfaces defining a generally horizontal plane of support for a flat glass sheet;

an elongated, flexible, electroconductive, electrical resistance heating element supported in a curved locus within a substantially horizontal plane slightly above said plane of flat glass support, and extending from one side of the bending mold to the opposite side;

a plurality of support means suspended above said flexible heating element, spaced apart along said curved locus;

a plurality of hanger means, each affixed to a respective one of said support means, for slidingly suspending the heating element and for guiding the heating element along said curved locus, and electrically insulated from the bending mold;

means for applying tension along the length of the heating element so as to maintain the heating element taut between said hanger means; and

means for supplying electrical energy to the heating element so as to radiate heat along a relatively narrow curved line across a glass sheet placed onto the bending mold.

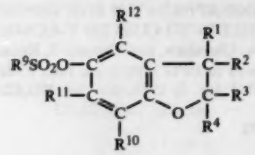
4,157,255

HERBICIDES

Peter S. Gates, Cambridge; John Gillon, Great Shelford, and David T. Saggers, Saffron Walden, all of England, assignors to Fisons Limited, London, England

Division of Ser. No. 648,161, Jan. 12, 1976, Pat. No. 4,072,495, which is a continuation-in-part of Ser. No. 275,256, Jul. 26, 1972, abandoned, which is a division of Ser. No. 826,274, May 20, 1969, Pat. No. 3,689,507. This application Oct. 31, 1977, Ser. No. 847,474
Claims priority, application United Kingdom, May 24, 1968, 24858/68; Feb. 8, 1969, 6951/69; Apr. 8, 1969, 17985/69
Int. Cl.[2] A01N *5/00, 9/28, 9/22*
U.S. Cl. 71—76 44 Claims

1. A plant growth regulant composition for effecting growth retardation comprising a plant growth regulating amount of a benzofuranyl compound of the formula



wherein R^1, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen and alkyl of 1 to 6 carbon atoms,

R^4 is $-NR^6R^7$ wherein R^6 and R^7 are the same or different members selected from the group consisting of alkyl of 1–4 carbon atoms and halogen substituted alkyl of 1 to 4 carbon atoms, or R^6 and R^7 together with the nitrogen to which they are attached form a heterocyclic ring selected from the group consisting of piperidino, morpholino, methyl piperazino and pyrrolidino,

R^9 is a member selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms substituted by halogen, alkyl of 1 to 4 carbon atoms substituted by alkoxy of 1 to 6 carbon atoms, phenyl and phenyl substituted by alkyl of 1 to 4 carbon atoms, and

R^{10}, R^{11} and R^{12} are the same or different and are selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and halogen, and an inert carrier or a wetting agent.

4,157,256

TETRAHYDROPHTHALIMIDE AND HERBICIDE CONTAINING THE SAME

Kunikazu Hiraga, Izumi; Shoichi Shibayama, Takatsuki; Isao Yanai, Osaka, and Tatsuo Harada, Kawachinagano, all of Japan, assignors to Nihon Nohyaku Co. Ltd., Tokyo, Japan

Filed Jan. 25, 1978, Ser. No. 872,339

Claims priority, application Japan, Jan. 28, 1977, 52-8334

Int. Cl.[2] C07D *209/48;* A01N *9/22, 9/24, 9/12*

U.S. Cl. 71—95 **4 Claims**

1. N-(p-trifluoromethoxyphenyl)-3,4,5,6-tetrahydrophthalimide.

3. A process of controlling undesired plants comprising applying to the plants a herbicidally effective amount of the compound according to claim 1.

4,157,257

BENZENESULFONAMIDE DERIVATIVES

Tetsuo Takematsu; Makoto Konnai, and Hiroyoshi Omokawa, all of Utsunomiya, Japan, assignors to Utsunomiya University, Tochigi, Japan

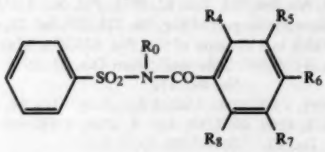
Filed Sep. 29, 1977, Ser. No. 837,911

Claims priority, application Japan, Oct. 1, 1976, 51/118343; May 20, 1977, 52/58369; Aug. 2, 1977, 52/92803

Int. Cl.[2] A01N *9/14;* C07C *143/79, 143/82*

U.S. Cl. 71—103 **21 Claims**

1. A compound of the formula



(I)

wherein R_O represents allyl or propargyl; and one or two of R_4, R_5, R_6, R_7 and R_8 represent a halogen atom and the remainder each represent hydrogen.

4,157,258

CASE-HARDENING ALLOY STEEL AND CASE-HARDENED ARTICLE MADE THEREFROM

Thoni V. Philip, and Robert W. Krieble, both of Reading, Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 815,231, Jul. 13, 1977, abandoned. This application Aug. 18, 1978, Ser. No. 935,003

Int. Cl.[2] C22C *38/42, 38/44*

U.S. Cl. 75—124 **14 Claims**

1. A case-hardening alloy steel which when case hardened and heat treated has, at room temperature, a core which has a hardness of at least Rc 32, a Charpy V-notch impact strength of at least 60 ft-lb, a fracture toughness of at least 80 ksi $\sqrt{in}$ combined with a case which has at room temperature a hardness of at least Rc 60 and a hot hardness at 400° F. of at least Rc 56, said alloy steel consisting essentially in weight percent of

	w/o
C	0.06–0.16
Mn	0.2–0.7
Si	0.5–1.5
Cr	0.5–1.5
Ni	1.5–3
Cu	1–4
Mo	2.5–4
V	Up to 0.4
P	Up to 0.05
S	Up to 0.05
N	Up to 0.03
Al	Up to 0.25
Cb	Up to 0.25
Ti	Up to 0.25
Zr	Up to 0.25
Ca	Up to 0.25

the sum of the percent nickel plus one-half the percent copper being equal to or less than 4%, and the balance consisting essentially of iron.

4,157,259

ERASURE IN MIGRATION IMAGING SYSTEM

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 454,515, Mar. 25, 1974, abandoned. This application Mar. 11, 1977, Ser. No. 776,566

Int. Cl.[2] G03G *13/22, 5/00, 5/02, 5/04*

U.S. Cl. 96—1 PS **18 Claims**

1. A process for erasing a migration image pattern comprising: (a) providing an image member comprising a layer of substantially electrically insulating softenable material and a layer of magnetizable migration material distributed as discrete particles each smaller than the migration image pattern in depth in said softenable material in image pattern configuration and comprising in addition to said image pattern of migration material a complementary background image layer of migration material in said softenable material and spaced apart, in depth, from said image pattern, said migration material being insoluble in said softenable material, said softenable material capable of being softened sufficiently to allow migration of said migration material in said softenable layer; (b) applying an electrical or magnetic migration force to the migration material sufficient to cause the image pattern of the migration material to migrate to the complementary background image layer of migration material; and (c) softening the softenable layer sufficient to allow migration of the migration material whereby the image pattern layer of migration material migrates to the complementary background image layer of migration material thereby erasing the image pattern and forming a reusable migration imaging layer.

2. A process for erasing a migration image pattern comprising: (a) providing an image member comprising a layer of substantially electrically insulating softenable material and a layer of migration material distributed as discrete particles

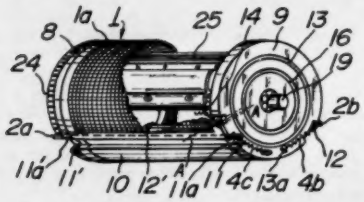
each smaller than the migration image pattern in depth in said softenable material in image pattern configuration and comprising in addition to said image pattern of migration material a complementary background image layer of migration material in said softenable material and spaced apart, in depth, from said image pattern, said migration material being insoluble in said softenable material, said softenable material capable of being softened sufficiently to allow migration of migration material in said softenable layer, wherein said softenable layer contains an overlayer of substantially electrically insulating material capable of retaining an electrostatic charge which is sufficient to cause migration to occur when the softenable material is softened sufficient to allow migration, said charge being retained on its surface for about 0.1 to about 30 seconds subsequent to the beginning of step (c); (b) applying an electrical or magnetic migration force to the migration material sufficient to cause the image pattern of migration material to migrate to the complementary background image layer of migration material; and (c) softening the softenable layer sufficient to allow migration of the migration material whereby the image pattern of migration material migrates to the complementary background image layer of migration material thereby erasing the image pattern and forming a reusable migration imaging layer.

4,157,260

SCREEN PHOTOSENSITIVE BODY FOR ELECTROGRAPHIC APPARATUS

Katsuhiko Kimura, and Kiyoshi Miyashita, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1977, Ser. No. 834,850
Claims priority, application Japan, Sep. 24, 1976, 51/113758
Int. Cl.[2] G03G *5/04, 15/00*
U.S. Cl. 96—1.5 R **7 Claims**



1. A drum-shaped photosensitive body for an electrographic apparatus, comprising: a drum-shaped frame (**7**); a mesh-shaped photosensitive body (**1**) spread under tension around said drum-shaped frame and having opposed circumferential side edges, said circumferential side edges extending circumferentially along said drum-shaped frame so as to be extensible along said drum-shaped frame; a supporting member formed by first and second elongated bar-shaped solid members (*2a, 2b*) secured near opposed end edges of said mesh-shaped photosensitive body **1**, said supporting member being operative for supporting said mesh-shaped photosensitive body to prevent it from deforming; and a resilient member (*4a, 4b*) connected to at least one of said elongated bar-shaped solid members to spread said mesh-shaped photosensitive body under tension around said drum-shaped frame.

4,157,261

TRANSFER PROCESS WITH POLYESTER (METH)ACRYLATE AS PHOTOPOLYMER

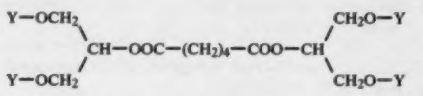
Keiji Takeda, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 645,132, Dec. 29, 1975, abandoned.
This application Sep. 20, 1977, Ser. No. 834,947
Claims priority, application Japan, Dec. 27, 1974, 50-679
Int. Cl.[2] G03C *11/12, 1/68, 5/00*
U.S. Cl. 96—28 **12 Claims**

1. An image forming dry type process which comprises imagewise exposing a laminate to actinic radiation through a transparent support, said laminate composed of a substrate, a photopolymerizable composition layer and a transparent support, superposed in that order, removing either the exposed portion or the unexposed portion of said photopolymerizable composition layer together with the support by stripping said support with the exposed or unexposed composition adhered thereto from the substrate; leaving the other of the exposed portion or the unexposed portion of said photopolymerizable composition layer on said substrate, the improvement wherein said photopolymerizable composition contains

(1) an addition polymerizable polyester acrylate or methacrylate selected from the group consisting of

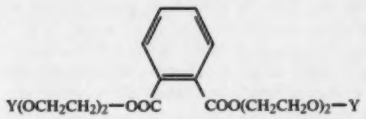
(a) a monomer having the formula (A)



(A)

wherein Y represents an acryloyl group or a methacryloyl group and wherein the average molar ratio of acryloyl to methacryloyl groups is 3:1;

(b) a monomer having the formula (B)



(B)

where Y represents an acryloyl group or a methacryloyl group and the average molar ratio of acryloyl groups to methacryloyl groups is 1:1;

(c) a monomer comprising the reaction product of acrylic acid, ethylene glycol and phthalic acid in a molar ratio of 2:2:1;

(d) a monomer comprising the reaction product of acrylic acid, methacrylic acid, glycerin and adipic acid in a molar ratio of 2:2:1:1;

(e) a monomer comprising the reaction product of acrylic acid, diethylene glycol and phthalic acid;

(f) a monomer comprising the reaction product of methacrylic acid, diethylene glycol and phthalic acid; and

(g) a monomer comprising the reaction product of acrylic acid, trimethylolpropane and tetrahydrophthalic acid;

each polyester acrylate or methacrylate having a molecular weight within the range of 246 to about 3,000;

(2) at least one photopolymerization initiator, and

(3) at least one chlorinated polyolefin binder.

4,157,262

INTENSIFICATION OF PHOTOGRAPHIC SILVER IMAGES BY PHYSICAL DEVELOPMENT AND IMPROVEMENT IN PHYSICAL DEVELOPER SOLUTION FOR USE THEREIN

Kikuo Kubotera; Akira Kashiwabara; Kotaro Sato; Hisatake Ono; Hideo Sato, and Yuzo Mizobuchi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minima-ashigara, Japan

Filed Apr. 28, 1977, Ser. No. 791,916

Claims priority, application Japan, Apr. 28, 1976, 51-49084; Apr. 30, 1976, 51-49666; Nov. 4, 1976, 51-132930

Int. Cl.[2] G03C 5/24, 5/54, 5/32

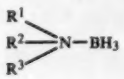
U.S. Cl. 96—29 R 5 Claims

1. A process for forming a photographic image, which comprises intensifying an unactivated silver image which comprises (a) a latent silver image of silver nuclei formed by light deposition in the exposed areas of a silver halide photographic element, (b) a silver image formed by chemical development in the exposed areas of a silver halide photograhic element, (c) a transferred silver image formed by a diffusion transfer process or (d) a silver image formed in the unexposed areas of a non-silver halide photographic element, said non-silver photographic element comprising a layer of a chalcogen compound and a layer of silver thereon or comprising a layer of a mixture of a chalcogen compound and silver; by applying to said silver image a non-silver physical developer solution containing

(1) at least one boron compound selected from the group consisting of amine borane compounds and boronhydride compounds,

(2) at least one compound selected from the group consisting of amine compounds, and

(3) a compound of a non-silver metal more base than silver; wherein said amine borane compound (1) is represented by the general formula (Ia)



(Ia)

wherein R^1, R^2 and R^3, which may be the same or different, each represents an alkyl group, an aralkyl group, an aryl group, an amino group or a hydrogen atom, in which said alkyl group, said aralkyl group and said aryl group may be substituted with one or more of a hydroxyl group and an amino group; with the proviso that when one of R^1, R^2 or R^3 is an amino group, the other two of R^1, R^2 and R^3 are not amino groups and all of R^1, R^2 and R^3 are not simultaneously hydrogen atoms; or by the general formula (Ib)

(Ib)

wherein R^4 represents an alkyl group, an aralkyl group, an aryl group or a hydrogen atom, and Z represents an atomic grouping necessary to form a saturated or unsaturated aromatic 5- or 6membered N-containing heterocyclic ring, and when there is a double bond to the N atom, R^4 is not present, and wherein R^4 and said atomic grouping formed by Z may be substituted with one or more of a hydroxyl group and an amino group; said borohydride compound (1) is at least one compound selected from the group consisting of compounds of the formula (Ic)

$$MBH_4 \qquad \text{(Ic)}$$

wherein M is an alkali metal atom; and said amine compound (2) is represented by the general formula (IIa)

(IIa)

wherein R^5, R^6 and R^7, which may be the same or different, each represents an alkyl group, an aralkyl group, an aryl group, an amino group or a hydrogen atom, in which said alkyl group, said aralkyl group and said aryl group may be substituted with one or more of a hydroxyl group and an amino group; with the proviso that when one of R^5, R^6 or R^7 is an amino group, the other two of R^5, R^6 and R^7 are not amino groups and all of R^5, R^6 and R^7 are not simultaneously hydrogen atoms; or by the general formula (IIb)

(IIb)

wherein W represents an atomic grouping necessary to form a saturated or unsaturated aromatic 5-, 6- or 7-membered heterocyclic ring; R^8 has the same meaning an R^5, and R^9 has the same meaning as R^5 or additionally represents a hydroxyl group, an amino group, a mono- or di-alkylamino group, an oxo group, an alkoxycarbonyl group, an amido group, an acyloxy group, an alkoxy group, an aryloxy group, a cyano group or a halogen atom, or a salt of a compound of formula (IIa) or (IIb) with acetic acid, propionic acid, oxalic acid, citric acid, sulfuric acid, nitric acid, phosphoric acid, carbonic acid, hydrogen chloride, hydrogen bromide or hydrogen iodide, with the proviso that when there is a double bond to the N atom, R^8 is not present;

wherein, when present in said physical developer solution, said amine borane compound is present in an amount of about 0.1 grams per liter to a saturated amount; when present in said physical developer solution, said borohydride compound is present in an amount of about 0.01 grams per liter to a saturated amount; said amine compound is present in an amount of about 0.1 grams per liter to a saturated amount; and said non-silver metal compound is present in an amount of about 0.01 to about 1 mole per liter; and

with the proviso that (i) where said boron compound (1) is a borohydride compound of the formula (Ic), said process is conducted at a temperature of about 15° C. to about 70° C.;

(ii) where said boron compound (1) is an amine borane compound of the formula (Ia) or (Ib) and is present in said physical developer solution in an amount of at least about 100 grams per liter of said physical developer solution, said process is conducted at a temperature of about 18° C. to about 95° C;

(iii) where said boron compound (1) is an amine borane compound of the formula (Ia) or (Ib) and is present in said physical developer solution in an amount of about 40 grams or less per liter of said physical developer solution, said process is conducted at a temperature of about 30° C. to about 95° C.;

(iv) where said boron compound (1) is an amine borane compound of the formula (Ia) or (Ib) and is present in said physical developer solution in an amount of about 40 grams to about 100 grams per liter of said physical developer solution, said process is conducted at a temperature within the range specified by a lower limit T where

$$T = 0.2M + 38$$

wherein T is the temperature in ° C. and N is the amount of said amine borane compound in grams per liter of said physical developer solution and an upper limit of 95° C.; and

(v) where said physical developer solution contains (1) an amine borane compound and a borohydride compound, said amine borane compound being present in an amount of about 40 grams or less per liter of the physical developer solution and the ratio of said borohydride compound to said amine borane compound is about 3:1 or less, said process is conducted at a temperature of about 30° C. to about 95° C.

4,157,263

CEMENTITIOUS COMPOSITIONS HAVING FAST-SETTING PROPERTIES AND INHIBITED SHRINKAGE

Robert W. Gaines, Darien; Dennison F. Fiala, Ridgefield, and Henry N. Babcock, Old Greenwich, all of Conn., assignors to U.S. Grout Corporation, Old Greenwich, Conn.

Continuation of Ser. No. 787,486, Apr. 14, 1977, abandoned, which is a division of Ser. No. 530,363, Dec. 6, 1974, Pat. No. 4,045,237. This application May 4, 1978, Ser. No. 902,697

Int. Cl.[2] **C04B** *7/02*

U.S. Cl. 106—89 **4 Claims**

1. In the method for repairing and waterproofing concrete structures and for filling voids and holes to form stable underpinnings or foundations for machinery and heavy equipment comprising admixing a cementitious composition with water and applying the admixture to said concrete structures or to said voids and holes, the improvement wherein the cementitious composition consists essentially of an admixture of high alumina cement and pressure calcined gypsum.

4,157,264

CALCIUM SULPHATE HEMIHYDRATE PLASTER

Henry K. Kennedy-Skipton, West Kilbride, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 19, 1977, Ser. No. 826,190

Claims priority, application United Kingdom, Sep. 15, 1976, 38190/76

Int. Cl.[2] **C04B** *11/14*

U.S. Cl. 106—111 **19 Claims**

1. A method of preparing a hardened calcium sulphate hemihydrate plaster comprising forming a set-inhibited slurry composition containing calcium sulphate hemihydrate, water and dissolved set-inhibiting agent, said set-inhibiting agent being selected from the group consisting of water-soluble polymers and copolymers of acrylic acid, and water-soluble salts of said polymers and copolymers, said polymers and copolymers having molecular weights within the range 2,000 to 75,000, and mixing with said slurry a promoter reactable with said set-inhibiting agent, said promoter comprising at least one salt selected from the group consisting of the water-soluble salts of iron, copper and aluminium whereby the effect of the set-inhibiting agent is neutralised and the setting of the composition is induced.

4,157,265

WATER-INSOLUBLE DISAZOMETHINE MIXED METAL-COMPLEX COMPOUNDS, PROCESS FOR PREPARING THEM AND THEIR USE AS COLORANTS

Theodor Papenfuhs, Frankfurt am Main, and Heinrich Volk, Bad Vilbel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

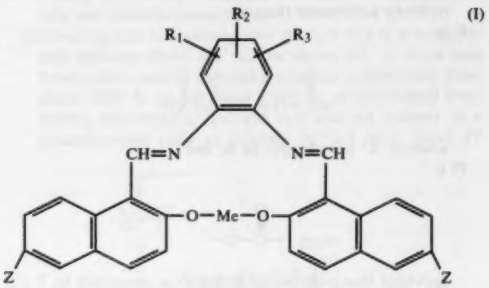
Continuation of Ser. No. 775,795, Mar. 9, 1977, abandoned. This application Jan. 30, 1978, Ser. No. 873,598

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1976, 2610308

Int. Cl.[2] **C07F** *15/04, 1/08*

U.S. Cl. 106—288 Q **13 Claims**

1. A mixed metal-complex consisting of at least two compounds of the general formula (I)



(I)

wherein each Z, which may be identical or different from one another, is hydrogen, halogen, lower alkoxy, nitro or cyano, Me stands for a bivalent metal atom, R_1 is hydrogen, halogen, lower alkoxy, lower alkyl, phenoxy unsubstituted or substituted by substituents selected from the group halogen, lower alkyl and lower alkoxy, or is hydroxy, cyano, trifluoromethyl, carboxy, lower carboxylic acid alkyl ester, lower alkanoyl benzoyl, benzoyl substituted by substitutents selected from the group halogen, lower alkyl and alkoxy, R_2 is hydrogen, halogen, lower alkoxy, lower alkyl, phenoxy, phenoxy substituted by substituents selected from the group halogen, lower alkyl and lower alkoxy, or is hydroxy, cyano, trifluoromethyl, carboxy, lower carboxylic acid alkyl ester, lower alkanoyl, benzoyl, benzoyl substituted by substituents selected from the group halogen, lower alkyl and lower alkoxy, and R_3 is hydrogen, halogen, lower alkoxy or lower alkyl.

4,157,266

DISPERSION OF PIGMENT OR DYESTUFF IN ORGANIC LIQUID

Frank Hauxwell; James F. Stansfield, and Arthur Topham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 531,787, Dec. 11, 1974, Pat. No. 4,042,413, which is a division of Ser. No. 330,882, Feb. 8, 1973, abandoned. This application Sep. 29, 1976, Ser. No. 727,794

Claims priority, application United Kingdom, Feb. 28, 1972, 9033/72

The portion of the term of this patent subsequent to Aug. 16, 1994, has been disclaimed.

Int. Cl.[2] **C08J** *3/20;* **C09B** *67/00;* **C09C** *3/08;* **C09D** *3/00*

U.S. Cl. 106—308 N **11 Claims**

1. Compositions of matter comprising a finely divided dispersion containing between 5 and 70% by weight based on the total weight of the composition of a solid dyestuff or pigment in an inert liquid hydrocarbon or an inert chlorinated hydrocarbon containing dissolved therein between 5% and 100% by weight based on the weight of the pigment or dyestuff of a dispersing agent which is an adduct of one or more compounds from each of the following classes:

(a) a polyisocyanate selected from the group consisting of 4:4'-diisocyanatodiphenylmethane, 2:4-diisocyanatotoluene, 2:6-diisocyanatotoluene and mixtures of 2:4- and 2:6-diisocyanatotoluene;

(b) an aliphatic diol containing from 5 to 10 carbon atoms; and

(c) a compound of the formula:

$$Z—X—E—(T—D)_{n-1}—Q$$

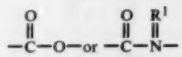
wherein Z represents —OH or —NHR, wherein R is alkyl or alkenyl containing up to 18 carbon atoms;

X is divalent aliphatic hydrocarbon, or a chloro substituent thereof, containing up to 17 carbon atoms;

T is divalent aliphatic hydrocarbon containing up to 17 carbon atoms;

n is a positive integer from 1 to 8;

Q is alkyl or alkenyl containing up to 18 carbon atoms or a hydroxy substituent thereof;
E is



wherein R^1 is hydrogen or R; and
D is

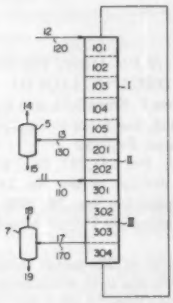
provided that only one of E and D is connected to T via the carbon atom of the carbonyl group present in E and D and that at least one of the groups represented by X, T, Q, R & R^1 contains a carbon chain having from 5 to 18 carbon atoms.

4,157,267

CONTINUOUS SEPARATION OF FRUCTOSE FROM A MIXTURE OF SUGARS

Hiroyuki Odawara; Masaji Ohno; Toru Yamazaki, all of Kamakura, and Masazumi Kanaoka, Tokyo, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 22, 1977, Ser. No. 826,640
Claims priority, application Japan, Aug. 24, 1976, 51/100151
Int. Cl.[2] C13K *1/00, 3/00, 11/00*
U.S. Cl. 127—46 A **3 Claims**



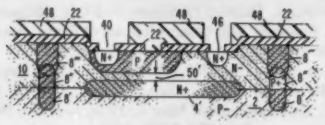
1. A process for continuously separating, in liquid phase, fructose from a liquid feed mixture of sugars containing essentially fructose and glucose, fructose being selectively sorbed by contact with solid sorbent particles of crystalline aluminosilicate or zeolite, utilizing a simulated counter-current flow system, wherein liquid streams are allowed to flow through three serially and circularly interconnected zones including a desorption zone, a rectification zone and a sorption zone, each zone being divided into a plurality of serially interconnected sections, each section being packed with a mass of said solid sorbent particles, comprising the steps of introducing said liquid feed mixture into the first section of said sorption zone, introducing water as a desorbent into the first section of said desorption zone, withdrawing a portion of a desorption effluent comprising the sorbate and the desorbent from the last section of said desorption zone for obtaining a product of fructose, withdrawing a portion of a raffinate effluent comprising less sorbed sugars and the desorbent from a point such that at least one section of said sorption zone remains downstream therefrom, and all of the points of introducing and withdrawing said liquid streams into and from said sections are simultaneously shifted one section at a time at predetermined intervals of time, in a downstream direction, while maintaining the same order of continuity and the same spatial relationship between said points, and circulating said liquid streams flowing in said three zones without any interruption of flow between said desorption zone and said rectification zone.

4,157,268

LOCALIZED OXIDATION ENHANCEMENT FOR AN INTEGRATED INJECTION LOGIC CIRCUIT

David L. Bergeron, Manassas, and Geoffrey B. Stephens, Catlett, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1977, Ser. No. 807,286
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 **9 Claims**



1. A process for forming an integrated circuit bipolar transistor logic structure capable of performing logical functions with lower voltage signals and capable of outputting from the integrated circuit higher voltage signals, comprising the steps of:
forming a first buried region and a second buried region of a second conductivity type in a semiconductor substrate of a first conductivity type;
depositing an epitaxial layer of said second conductivity type over said first and second buried regions and said substrate;
implanting ions in the surface of said epitaxial layer over said first buried region to induce crystalline damage sufficient to enhance the reactivity of the implanted region in an oxidation reaction;
oxidizing the surface of said epitaxial layer forming a relatively thick oxide in said implanted region thereby forming a locally thinner region in the epitaxial layer over said first buried region, and a thicker epitaxial region over said second buried region;
forming a first and a second base regions of said first conductivity type in said epitaxial layer at first and second respective separation distances over said first and second buried regions, respectively; and
forming a collector region in said first base region and an emitter in said second base region, of said second conductivity types;
whereby said thinner epitaxial layer over said first buried region imparts a lower charge storage characteristic and a higher injection efficiency for an upward injecting transistor and said thicker epitaxial layer over said second buried region imparts a higher voltage breakdown characteristic for a downward injecting transistor.

4,157,269

UTILIZING POLYSILICON DIFFUSION SOURCES AND SPECIAL MASKING TECHNIQUES

Tak Hung Ning, and Hwa Nien Yu, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 6, 1978, Ser. No. 912,919
Int. Cl.[2] H01L *21/225, 21/285*
U.S. Cl. 148—1.5 **10 Claims**

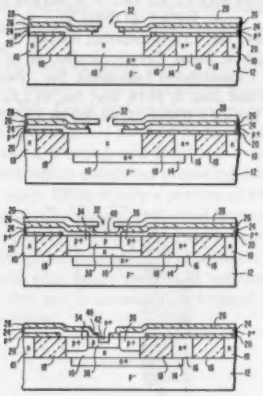
1. A method of fabricating a bipolar structure having base contacts formed of polysilicon material comprising:
A. forming, on a semiconductor substrate of a first conductivity type having a collector region of opposite conductivity type disposed therein, a layer of opposite conductivity type epitaxil material having at least two oxide regions therein spaced apart a given distance over said collector region,
B. forming a first masking layer over said epitaxial layer

having an opening therein in the area between said oxide isolation regions,

C. forming a layer of polysilicon material having first conductivity type impurities therein over said masking layer, said polysilicon material being in contact with said layer of epitaxial material in said open area of said masking layer,

D. forming a layered masking structure over said layer of polysilicon material, said layered masking structure having an opening therein to provide an emitter window in the region above said opening in said first masking layer,

E. etching through said opening in said layered making structure to provide an opening to said layer of epitaxial material,



F. diffusing impurities of said first conductivity type into said layer of epitaxial material in between said at least two oxide isolation regions to form extrinsic base regions beneath and in contact with said polysilicon material, and to form an intrinsic base region intermediate said extrinsic base regions and beneath said opening formed in step E,

G. and implanting impurities of said opposite conductivity type through said opening formed in step E to form an emitter, thereby providing a bipolar structure having extrinsic base regions containing first conductivity type impurities in contact with polysilicon material containing first conductivity type impurities and an emitter containing opposite conductivity type impurities.

4,157,270

HYDROGEN GAS GENERATOR FROM HYDRAZINE/AMMONIA

Pasquale Martignoni; William M. Chew; Orval E. Ayers, and James A. Murfree, Jr., all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

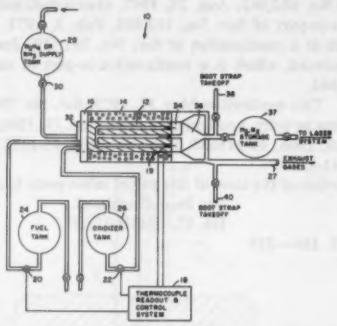
Filed Sep. 12, 1977, Ser. No. 832,711
Int. Cl.[2] C09K *3/00;* **C06C** *9/00*
U.S. Cl. 149—109.6 **5 Claims**

1. A method of producing ammonia free deuterium and nitrogen or hydrogen and nitrogen at a temperature required for immediate use in a DF or HF laser which uses F atoms as the fuel, said method comprising:

(i) providing a catalyst bed containing alumina pellets on which an active catalyst metal selected from iridium, nickel, niobium, and molybdenium has been deposited;

(ii) equiping said catalyst bed with a means for heating and a means for maintaining a temperature between about 500° C. and about 900° C. said means including a hypergolic reaction produced from reacting a fuel selected from the group consisting of hydrazine, methylhydrazine, 1,2-dimethylhydrazine, and blends of the same with an oxidizer selected from the group consisting of inhibited red fuming nitric acid, dinitrogen tetroxide, chlorine trifluoride and chlorine pentafluoride;

(iii) heating and maintaining said catalyst bed at a temperature between about 500° C. and about 900° C. from said hypergolic reaction to yield a reaction temperature from about 3000° K. and to about 4,000° K. as determined from mixing said selected fuel and said selected oxidizer in a predetermined ratio of oxidizer to fuel from about 57



weight percent to about 75 weight percent oxidizer to about 25 weight percent fuel to about 43 weight percent fuel; and,

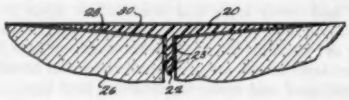
(iv) admitting a compound selected from deuteroammonia, deuterohydrazine, hydrazine, and ammonia to said catalyst bed to effect decomposition to yield a mixture of said deuterium and nitrogen or a mixture of said hydrogen and nitrogen as determined by said compound selected.

4,157,271

DRYWALL JOINT FILLER

Dan B. Moore, P.O. Box 1060, Huntington, W. Va. 25701

Continuation of Ser. No. 805,451, Jun. 10, 1977, abandoned, which is a continuation of Ser. No. 568,945, Apr. 17, 1975, abandoned. This application May 9, 1978, Ser. No. 904,221
Int. Cl.[2] E04B *2/72, 2/00*
U.S. Cl. 156—71 **2 Claims**



1. A method of joining a pair of abutting drywall panels comprising:

placing an extending strip of flexible material having a spline extending outward from the strip near the center of the width and along the length and a thickness which tapers away from said spline with said spline in the space between the abutting panels,

adhering the surfaces of said strips extending away from said spline to the surfaces of said abutting panels extending away from said space, and

covering said strips with a coating to form a smooth surface.

4,157,272

METHOD OF MAKING AN APPLIQUE ARTICLE

Minoru Kuroda, Amagasaki, Japan, assignor to Nishizawa Shoji, Ltd., Osaka, Japan and The Dimension Weld International Corporation, Stamford, Conn.

Continuation of Ser. No. 646,960, Jan. 7, 1976, which is a continuation-in-part of Ser. No. 393,791, Sep. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 113,088, Feb. 5, 1971, abandoned, which is a continuation-in-part of Ser. No. 662,962, Aug. 24, 1967, abandoned, and a continuation-in-part of Ser. No. 112,403, Feb. 3, 1971, abandoned, which is a continuation of Ser. No. 792,719, Jan. 21, 1969, abandoned, which is a continuation-in-part of said Ser. No. 662,962.

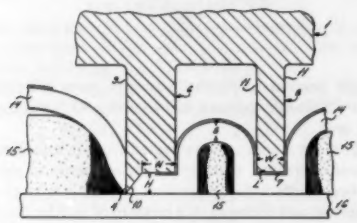
This application May 17, 1977, Ser. No. 797,792

Claims priority, application Japan, Dec. 19, 1966, 41-115532; Dec. 19, 1966, 41-115533; Dec. 19, 1966, 41-115535; Dec. 19, 1966, 41-83085

The portion of the term of this patent subsequent to Jun. 5, 1996, has been disclaimed.

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—219 9 Claims



1. A method of making an adhesive applique article, comprising the steps of providing a base layer of sheet material; providing an adhesive backing on only one surface of said base layer; providing a release layer; providing a cover layer of sheet material having a design surface with an outer contour line, and a narrow bonding zone along said outer contour line; further providing an intermediate layer of resiliently compressible latently adhesive material having spaces filled with a gaseous medium; forming a sandwich composed of said release layer, said base layer superimposed on said release layer with said adhesive backing thereof in contact with said release layer; said intermediate layer superimposed with one surface thereof on the other surface of said base layer and said cover layer superimposed on the other surface of said intermediate layer; and pressing said cover layer at least within said bonding zone against said intermediate layer and said base layer while activating only said latently adhesive material and thereby bonding said cover layer by said latently adhesive material to said other surface of said base layer in said bonding zone, and severing said cover layer and intermediate layer along said outer contour line, the presence of said intermediate layer resulting in formation of a cushion between said base layer and said cover layer in the area surrounded by said bonding zone upon bonding of said cover layer to said base layer.

4,157,273

BONDING WITH A POLY(ARYLENE SULFIDE)-POLYTETRAFLUOROETHYLENE ADHESIVE

Donnie G. Brady, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 20, 1975, Ser. No. 560,394

Int. Cl.[2] C09J *5/04*

U.S. Cl. 156—315 7 Claims

1. The method of bonding a first material to a second material which comprises applying a coating of a mixture of a poly(arylene sulfide) and polytetrafluoroethylene to each of the materials, heating each coating to effect a partial cure of the poly(arylene sulfide) before the two materials are placed adjacent one another, and thereafter placing the two materials adjacent one another so that the thus partially cured coatings of each material contact one another, and heating the mixture to effect a cure of the poly(arylene sulfide) and thereby bond the two materials together.

4,157,274

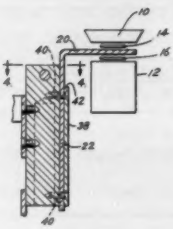
PACKAGE STRAPPING DEVICE WITH FLOATING HEAT TONGUE

Eric A. Johnson, III, Crawfordsville; Melvin E. Moore, Rockville, and Tom A. Budd, Crawfordsville, all of Ind., assignors to Keystone Consolidated Industries, Inc., Peoria, Ill.

Filed Jun. 5, 1978, Ser. No. 912,511

Int. Cl.[2] B30B *15/34;* B32B *31/00*

U.S. Cl. 156—499 7 Claims



1. In an apparatus adapted to form a heat seal in overlapping portions of a plastic strap, the apparatus including a heat tongue holder, heater means within the holder for conducting heat to the heat tongue, means for advancing and retracting the holder toward and away from the overlapping portions of the plastic strap and means for compressing the overlapping portions of the strap during a heat seal operation, the compression means including relatively movable pressure plates to compress the overlapping portions of the plastic strap therebetween, an improved heat tongue and mounting therefor comprising, in combination:

a metal heat tongue having a first relatively flat run adapted to be interposed between overlapping portions of the plastic strap and a second relatively flat run forming an angle with respect to the first run,

means for floatably mounting the heat tongue for sliding vertical movement within the heat tongue holder, the mounting means includng a recessed channel running through the holder from an upper portion thereof in a substantially vertical direction adapted to slidably receive the second run of the heat tongue, the recessed channel having a cross-section complementary to and just slightly larger than the cross-section of the second run of the heat tongue, the second run being inserted in the channel of the holder whereby the first run may abut an upper surface of the holder to limit further downward movement of the second run in the channel whereby the heat tongue is maintained in a fixed predetermined position in relation to the holder when the holder is advanced to interpose the first run between overlapping portions of the plastic strap and whereby the heat tongue is then free to slide upwardly with the upward movement of the lower pressure plate toward the upward pressure plate and to automatically return to its fixed predetermined position in the holder after the holder is withdrawn from proximity with the overlapping strap portions.

4,157,275

POLYVINYL ALCOHOL FIBERS CONTAINING ACICULAR COLLOIDAL CLAY

Orin Hollander, Piscataway, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Dec. 14, 1977, Ser. No. 860,296
Int. Cl.[2] D21F *11/00*
U.S. Cl. 162—146 10 Claims

1. Fibers comprising insolubilized polyvinyl alcohol having disseminated therein acicular particles of a colloidal grade of crystalline clay selected from the group consisting of attapulgite, sepiolite and palygorskite, said clay being present in amount sufficient to impart opacity but not in excess of an amount which would result in brittle fibers, said fibers being capable of being partially or totally substituted for cellulose fibers in the making of a sheet of paper by conventional paper-forming means.

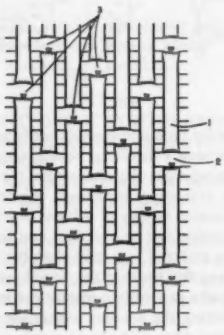
8. In the production of paper using a wet forming method conventional for use with a wood pulp fiber furnish and including forming suitable fibers into an aqueous papermaking pulp fiber furnish by agitating said fibers in water, forming said pulp furnish into a sheet, pressing said sheet and drying said sheet, the improvement which comprises preparing said pulp furnish by agitating in water fibers at least a portion of which comprise insolubilized plasticized polyvinyl alcohol having disseminated therein acicular particles of a colloidal grade of crystalline clay selected from the group consisting of attapulgite, sepiolote and palygorskite, said clay being present in amount sufficient to impart opacity but not in excess of an amount which would result in brittle fibers.

4,157,276

PAPER MACHINE FABRIC IN AN ATLAS BINDING

Hermann Wandel, and Fritz Bleher, both of Reutlingen, Fed. Rep. of Germany, assignors to Hermann Wangner, Reutlingen, Fed. Rep. of Germany

Filed Apr. 8, 1976, Ser. No. 674,817
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1975, 2517228
Int. Cl.[2] D21F *1/10*
U.S. Cl. 162—348 3 Claims



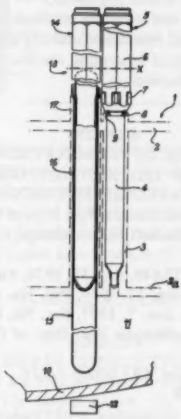
1. In combination with a paper making machine having a wet paper processing end section, a water-permeable screen located in said machine wet end section and facilitating the wet batching or passage of said wet paper through that section of the machine, said screen being constituted of plastic monofilament warp and weft threads woven into at least a five-shed binding having uniformly distributed binding points, said binding points being spaced and not touching each other, and said screen having the weft counts thereof higher than four-fifths of the current number of the warp threads.

4,157,277

DEVICE FOR MEASURING NEUTRON FLUX IN A NUCLEAR REACTOR

Pierre L. Marmonier, Aix-en-Provence; Jean Moreau, Manosque, and Jean-Claude Nervi, Oraison, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 20, 1977, Ser. No. 834,970
Claims priority, application France, Sep. 21, 1976, 76 28334
Int. Cl.[2] G21C *17/00*
U.S. Cl. 176—19 J 9 Claims



1. A device for measuring neutron flux in a nuclear reactor comprising a vessel which contains a liquid medium for cooling the reactor core formed by the juxtaposed arrangement of fertile fuel assemblies and blanket assemblies disposed in a vertical position, each assembly aforesaid being provided with an open-topped wrapper having an axial extension in the form of a bottom end-fitting for positioning the assembly in a diagrid by means of a support sleeve in which said end-fitting is inserted, the device aforesaid being provided with at least one neutron detection chamber placed beneath the reactor vessel externally and as close as possible thereto and with a neutron guide located vertically above said detection chamber and constituted by a tubular casing occupied at least partially by an inert gas and extending from the reactor core to the immediate vicinity of the bottom of the reactor vessel, said casing being provided with a wrapper having an external profile which is identical with that of the reactor core assemblies and with a positioning end-fitting which penetrates into a support sleeve of the reactor diagrid, wherein the neutron guide is constituted by two superposed and separable elements, the first and upper element being such as to contain on the one hand a neutron-emissive medium which extends at least over the greater part thereof above the central plane of the reactor core and on the other hand beneath said emissive medium a closed tube filled with inert gas and engaged coaxially within the second and lower element, said second element being positioned within the interior of the support sleeve and adapted to terminate at the lower end thereof in another closed tube filled with inert gas and placed in the line of extension of the closed tube of the first element so as to terminate in the vicinity of the internal surface of the bottom of the reactor vessel.

4,157,278
IMMUNOSTIMULATORY AGENTS

Gordon W. Ross, Ruislip; Monica J. Gardner nee Marshall, North Harrow, and Walter Wolff, London, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed Mar. 21, 1978, Ser. No. 888,782
Claims priority, application United Kingdom, Mar. 22, 1977, 12090/77
Int. Cl.[2] C12B *1/00, 1/00;* A61K *37/00*
U.S. Cl. 195—4 25 Claims

1. A process for the production of a water-soluble fraction containing peptidoglycan material having immunostimulatory activity wherein the mycelium of a strain of Streptomyces griseus is treated with a bacteriolytic enzyme in an aqueous medium to solubilise bound peptidoglycan components of the cell walls thereof in said aqueous medium to yield a fraction containing the desired immunostimulatory activity, said process including the step of separating nucleic acid material from said peptidoglycan fraction.

4,157,279
PROCESS FOR THE DETERMINATION OF AT LEAST ONE OF THE ISOENZYMES OF LACTATEDEHYDROGENASE

Walther Lamprecht, Isernhagen, Fed. Rep. of Germany, assignor to Kommanditgesellschaft Schwarzhaupt, Cologne, Fed. Rep. of Germany

Division of Ser. No. 723,649, Sep. 15, 1976, which is a division of Ser. No. 612,633, Sep. 12, 1975, Pat. No. 4,003,795. This application Jun. 7, 1977, Ser. No. 804,377
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1974, 2443741
Int. Cl.[2] G01N *31/14*
U.S. Cl. 195—103.5 R 7 Claims

1. A method for diagnosing pathological changes in the lower female genital tract by determining specific isoenzymes of the lactatedehydrogenase (LDH) which method comprises applying a test reagent composed of

1.0 to 150 mM of a buffer adapted to provide about a pH of 7 for the reagent prior to use

20 to 350 mM sodium salt of DL-lactic acid

0.01–1.0 mM phenazinemethosulfate (PMS)

0.1–10 mM nicotinamide-adenine-dinucleotide (NAD^+)

0.01–1.5 mM nitro-blue-tetrazoliumchloride (NBT)

onto a carrier adapted for insertion into the vagina, inserting said carrier in the lower female genital tract, the test reagent providing a pH between about 6 and 6.5 when in the vagina, leaving said carrier in said tract for at least 10 minutes than removing said carrier and observing the carrier for the appearance of a blue coloration indicating the presence of said enzymes, particularly of the isoenzymes 4 and 5.

4,157,280
TEST SET FOR DETECTING THE PRESENCE OF ANTIGENS ASSOCIATED WITH HEPATITIS

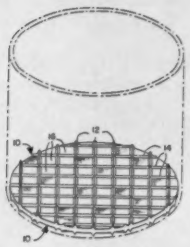
Seymour P. Halbert, Miami, and Milton Anken, North Miami Beach, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Sep. 29, 1975, Ser. No. 617,745
Int. Cl.[2] G01N *31/14, 33/16*
U.S. Cl. 195—127 13 Claims

1. a test set useful for detecting the presence of antigens associated with hepatitis is a test sample comprising, in combination:

an insoluble polymeric solid having a layer of protein reactive groups grafted into its surface and having hepatitis associated antibody bonded to said reactive groups, the surfaces on said solid being distorted to comprise a field of high and low points to provide a solid which, when placed in a flat-bottomed vial, will be substantially in contact with any solution in the vial while minimizing surface-to-surface contact, said solid being for immobilizing hepatitis antigens from the sample;

an alkaline phosphatase - antibody conjugate reagent for labeling hepatitis antigen immobilized on said solid;



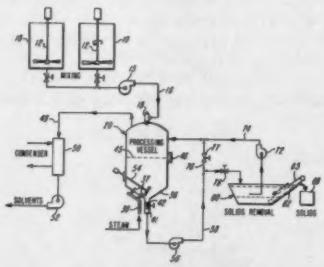
an enzyme substrate capable of being chemically changed under the catalytic influence of the alkaline phosphatase; and

a flat-bottomed vial sized to receive said solid.

4,157,281
METHOD AND APPARATUS FOR RECLAIMING SOLVENTS FROM SOLVENT-BEARING SLUDGE MATERIAL

Daniel F. Burkhardt; Carl A. Evers; Anthony H. Kohnen, all of Kettering; Robert L. Kohnen, Centerville; Gary E. Smith, Alpha, and Thomas J. Wittman, Dayton, all of Ohio
Assignors to Systems Technology Corporation, Xenia, Ohio

Filed Jul. 14, 1977, Ser. No. 815,640
Int. Cl.[2] B01D *1/14*
U.S. Cl. 202—176 11 Claims



1. Apparatus for reclaiming a solvent from a solvent bearing material, comprising a distilling vessel containing a volume of liquid and defining a gas chamber above the level of the liquid, a first conduit extending from said chamber for directing a generally continuous supply of solvent bearing material to said vessel, means connected to said first conduit for spraying the solvent bearing material into said chamber above the level of the liquid, means for heating the liquid within said vessel to hold the liquid at a generally constant predetermined temperature for volatilizing the solvent within the material, a second conduit extending from said chamber for removing the volatilized solvent from said chamber, means for condensing the volatilized solvent removed from said chamber, means for agitating the liquid within the lower portion of said vessel for maintaining solid particles in suspension within the liquid, means including a third conduit connected to the bottom of said vessel for continuously removing a mixture of liquid and suspended solid particles from said vessel while solvent bearing material is being sprayed into said chamber above the liquid, means for continuously separating solid particles from the liquid after the mixture is removed from said vessel, and means for continuously returning the liquid to said vessel after the solid particles are separated from the liquid to maintain a

generally constant volume of liquid within said vessel and to minimize heat loss from the liquid.

4,157,282

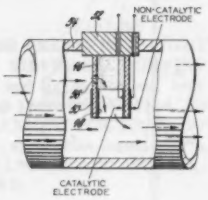
METHOD FOR MAINTAINING STOICHIOMETRIC AIR/FUEL MIXTURES

John W. Riddel, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 524,674, Nov. 18, 1974, abandoned. This application Aug. 18, 1977, Ser. No. 825,597

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—1 T **2 Claims**



1. A method for maintaining internal combustion engine air/fuel mixtures at stoichiometry by electrochemical analysis of engine exhaust gases, using non-equilibrium oxygen content of exhaust gases from both rich and lean air/fuel ratios as a reference, comprising:

forming a single stream of exhaust gases from an internal combustion engine intended to combust stoichiometric air/fuel mixtures, said single stream being from fuel-rich, fuel-lean and stoichiometric air/fuel mixtures and always non-equilibrated;

directing said single stream simultaneously across two opposite major faces of a zirconium dioxide solid electrolyte body to establish an output voltage between catalytic and non-catalytic gas pervious electrodes respectively on said faces, based on non-equilibrium oxygen content in said exhaust gases as a reference atmosphere regardless as to the air/fuel ratio from which produced;

generating an electrical control signal in response to said output voltage that is representative of a substantially stoichiometric air/fuel mixture to be introduced into said engine; and

regulating air/fuel mixtures introduced into said engine in response to said electrical control signal.

4,157,283

SULFIDE MONITORING SYSTEM AND METHOD

Mark S. Zetter, Santa Clara, Calif., assignor to Delphian Corporation, Los Altos, Calif.

Filed Aug. 30, 1977, Ser. No. 829,041

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—1 T **8 Claims**

1. Apparatus for measuring the concentration of hydrosulfide ion in well drilling mud comprising, in combination,

hydrogen ion electrode means for providing an output signal having an electrical potential which is a function of hydrogen ion concentration,

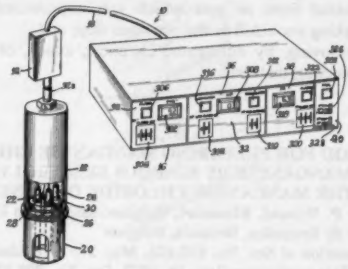
sulfide ion electrode means for providing an output signal having an electrical potential which is a function of sulfide ion concentration,

means for subtracting a signal representative the electrical potential of the hydrogen ion electrode means from a signal representative of the electrical potential of the sulfide ion electrode means in a ratio of hydrogen ion potential to sulfide ion potential of about 1:2 to provide a difference output signal which varies as a function of hydrosulfide ion concentration.

4. A method for measuring the concentration of hydrosulfide ion in well drilling mud comprising the steps of

measuring hydrogen ion concentration in said mud to provide an output signal having an electrical potential which is a function of hydrogen ion concentration,

measuring sulfide ion concentration in said mud to provide an output signal having an electrical potential which is a function of sulfide ion concentration, and



subtracting said signal representative the electrical potential of the hydrogen ion concentration from said signal representative of the electrical potential of the sulfide ion concentration in a ratio of hydrogen ion potential to sulfide ion potential of about 1:2 to provide a difference output signal which varies as a function of hydrosulfide ion concentration.

4,157,284

PROCESS TO OBTAIN CONDUCTIVE AND RESISTIVE ELEMENTS IN MICROWAVE MICROCIRCUITS

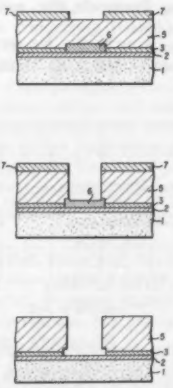
Marina Bujatti, Via Grossi Gondi, 62, Rome, Italy (00162); Carlo Misiano, Via G.B. Morgagni, 22, Rome, Italy (00161), and Enrico Simonetti, Piazza della Radio, 14, Rome, Italy (00146)

Filed Dec. 27, 1977, Ser. No. 864,639

Claims priority, application Italy, Dec. 28, 1976, 52808 A/76

Int. Cl.[2] C25D *5/02, 5/10*

U.S. Cl. 204—15 **6 Claims**



1. A process to obtain conductive and resistive elements in a microwave microcircuit comprising:

(a) depositing on an insulating substrate a layer of a thin film constituted by a high resistive material over which is deposed a layer of thin film also constituted by a high conductive material;

(b) removing said high conductive film by means of photoetching from an area to constitute a resistive element;

(c) electrolytically depositing, on said area constituting the resistive element, a masking material;

(d) electrolytically depositing a layer of thick film of conductive material over the substrate;
(e) electrolytically depositing, by means of a suitable masking, a protecting material deposed on an area to constitute a conductive element;
(f) removing, by ionic erosion, said thick film of conductive material from an area which was unprotected by the masking provided in the previous step; and
(g) removing, by differential chemical, attack, of residual protecting material.

4,157,285

METHOD FOR PREPARING MANGANESE CHLORIDE AND MANGANESE BY IGNEOUS ELECTROLYSIS OF THE MANGANESE CHLORIDE OBTAINED

Rene F. P. Winand, Rixensart, Belgium, assignor to Universite Libre de Bruxelles, Brussels, Belgium

Continuation of Ser. No. 690,433, May 27, 1976, abandoned. This application Jun. 20, 1977, Ser. No. 808,179
Claims priority, application Belgium, May 27, 1975, 829553
Int. Cl.[2] C25C *3/00*
U.S. Cl. 204—64 R **12 Claims**

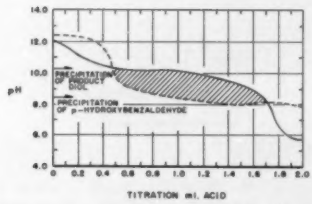
1. A method for recovering manganese which comprises:
(a) reacting a manganese oxide with at least one fused chloride selected from the group consisting of calcium chloride and magnesium chloride to provide a liquid phase containing manganese chloride and fused chloride, and a solid phase containing reaction residue, the temperature of the reaction being at or above the melting point of the calcium or magnesium chloride but below the boiling point of manganese chloride in the reaction mixture; and
(b) electrolyzing the liquid phase containing the manganese chloride to deposit manganese metal upon the cathode and release chlorine at the anode, said chlorine being recovered in elemental form.

4,157,286

PRODUCTION OF 1,2-BIS(HYDROXYPHENYL)ETHANE-1,2-DIOLS BY ELECTROLYTIC REDUCTION

Christopher J. H. King, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 4, 1978, Ser. No. 893,219
Int. Cl.[2] C25B *3/10, 15/08*
U.S. Cl. 204—73 R **7 Claims**



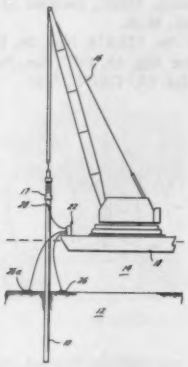
1. In a process for the electrolytic reduction of hydroxybenzaldehyde to produce the corresponding 1,2-bis (hydroxyphenyl)ethane-1,2-diol which comprises electrolyzing in an undivided reaction cell an aqueous electrolyte solution comprising the hydroxybenzaldehyde in water, the aqueous solution being in contact with a cathodic surface having a cathode potential sufficient for electrolytic reduction of the hydroxybenzaldehyde, the improvement comprising maintaining the aqueous electrolyte solution in a pH range in which the 1,2-bis(hydroxyphenyl)ethane-1,2-diol precipitates from the solution and the hydroxybenzaldehyde remains in solution; and filtering the solution and precipitate thereby to collect the 1,2-bis(hydroxyphenyl)ethane-1,2-diol.

4,157,287

METHOD OF ASSISTING PILE DRIVING BY ELECTRO-OSMOSIS

Lowell B. Christenson, 7410 Thurow, Houston, Tex. 77087

Filed Aug. 25, 1978, Ser. No. 936,981
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—180 R **3 Claims**



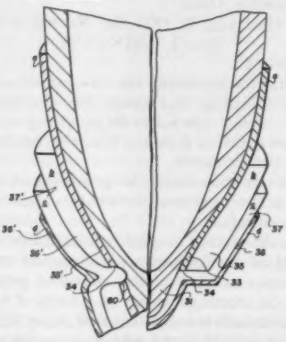
1. A method of assisting the driving of a hollow electrically conductive pile, which is coated on the outside with an electrical non-conductor, into soil containing water comprising,
placing an anode of an electrical circuit having an anode, a d-c power source, and a cathode, in the water outside of the hollow pile,
attaching the cathode to the electrically conductive pile,
when the pile is in contact with the soil applying electrical power to the circuit whereby water will be caused to move down the outside of the pile through the soil adjacent the pile and towards the inside of the pile making the pile easier to drive through the soil.

4,157,288

POLAROGRAPHIC MEASURING PROBE WITH DIFFUSION FILM MEMBRANE

Wolfgang Fleckenstein, Kiel, and Helmut Rinne, Lübeck, both of Fed. Rep. of Germany, assignors to Dragerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 7, 1977, Ser. No. 858,447
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1976, 2655318
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 P **4 Claims**



1. A measuring probe comprising a support body having a tip, a first metal electrode film overlying said support, an insulation film overlying a major portion of said first metal

electrode film, an inner film of inorganic insulation material overlying said insulation film, a second metal electrode film overlying said insulation film, said first metal electrode film having an annular edge defining a measuring point around said tip, at least said inorganic insulation film covering said measuring point, said second metal electrode being separated from said first metal electrode film at least by said inner film of inorganic material, said first metal film ending in an annular edge around said tip covered by said inorganic insulation material, said inorganic insulation material selected from the group consisting of an oxide of Al, Bi, Ta, Si, Zr, or Ti; or a nitride of Si, Zr or Ti.

4,157,289

PROCESS FOR PREPARING SLIGHTLY SOLUBLE SILVER SALT GRAINS

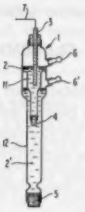
Shinpei Ikenoue, and Takao Masuda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 8, 1978, Ser. No. 903,435

Claims priority, application Japan, May 6, 1977, 52-51872

Int. Cl.[2] B01K *3/00*; G03C *1/02, 1/76*

U.S. Cl. 204—195 F **20 Claims**



1. In a process for preparing slightly soluble silver salt grains by mixing a solution or dispersion of a silver salt-forming agent as a first liquid with a solution or dispersion of a silver ion-providing agent as a second liquid while controlling the electrode potential of the mixture of said first liquid and said second liquid using a measuring electrode and a reference electrode to produce said slightly soluble silver halide grains of specific characteristics depending upon the control of the electrode potential, the improvement which comprises said reference electrode comprising an internal electrode of a metal immersed in an internal solution of a metal salt of the metal of said internal electrode and an electrolyte, which metal salt and electrolyte do not release halide ions in the same liquid present as the major component in either of said first liquid or said second liquid.

4,157,290

COATING ARRANGEMENT

Koydl Ladislav, and Mielsch Götz, both of Munich, Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Fed. Rep. of Germany

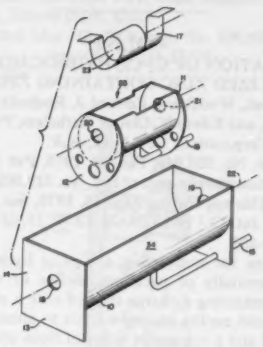
Filed Aug. 29, 1978, Ser. No. 937,864

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1977, 2738922

Int. Cl.[2] C25C *7/00*

U.S. Cl. 204—207 **8 Claims**

1. A galvanic coating apparatus for coating relatively long objects, characterized in that a trough means is provided for accommodating a liquid bath, said trough means including two oppositely disposed end walls, each of said end walls is provided with an opening therein, a container means for accommodating said trough means, said container means included oppositely disposed end walls with each of said end walls of said container means being provided with openings therein, the openings in the end walls of the trough means and the openings in the end walls of the container means being arranged so as to be in alignment when the trough means is disposed in the container means so that an object to be coated is permitted to



pass through the end walls of the trough means and container means.

4,157,291

PROCESS FOR EXTENDING LIFE OF COAL LIQUEFACTION CATALYST

John A. Paraskos, and Herman Taylor, Jr., both of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 746,179, Nov. 30, 1976, abandoned. This application Feb. 15, 1978, Ser. No. 878,019

Int. Cl.[2] C10G *1/06*

U.S. Cl. 208—10 **13 Claims**

1. A process for liquefying coal comprising passing an ash-containing coal-solvent slurry and hydrogen through a heating zone and a catalytic hydrogenation zone, said hydrogenation zone containing particles of hydrogenation catalyst comprising Group VI and Group VIII metals, said particles of catalyst being cemented with coal and ash to form a continuous solid mass during said process, terminating said process upon reduction in catalytic hydrogenation activity, removing said catalyst as a continuous ash and coal-containing solid mass from said hydrogenation zone, crumbling said continuous solid mass into a crumbled mass comprising relatively small and relatively catalyst-free ash and coal-containing particulate impurities, said catalyst free ash particulate impurities being small compared to the size of said particles of catalyst said crumbling step occuring substantially without size reduction of said catalyst particles, separating said relatively small ash and coal-containing particulate impurities from said catalyst particles and returning said catalyst particles substantially without size reduction to said process.

4,157,292

HYDROCRACKING PROCESS TO MAXIMIZE MIDDLE DISTILLATE

Mark J. O'Hara, Mt. Prospect; Russell W. Johnson, Hoffman Estates, and Lee Hilfman, Mt. Prospect, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 820,492, Jul. 29, 1977, abandoned. This application Jun. 20, 1978, Ser. No. 917,431

Int. Cl.[2] C10G *13/02*; B01J *29/12*

U.S. Cl. 208—111 **6 Claims**

1. A process for the production of middle distillate hydrocarbons boiling in the range of about 350° F. to about 650° F. which comprises hydrocracking hydrocarbons boiling above about 650° F. in admixture with hydrogen at a temperature of from about 400° F. to about 1000° F. and an elevated pressure up to about 3000 psig in contact with a hydrocracking catalyst consisting essentially of an alumina-zeolite support, a rare earth exchange metal, at least one metal component from Group VIB or Group VIII and containing at cation exchange sites

from about 0.9 to about 5 weight percent of at least one component from Group IA based on the weight of the finished catalyst.

4,157,293

AROMATIZATION OF C_2-C_{10} HYDROCARBONS OVER STABILIZED ZINC-CONTAINING ZEOLITES

Charles J. Plank, Woodbury; Edward J. Rosinski, Pedricktown, both of N.J., and Edwin N. Givens, Bethelem, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 551,949, Feb. 21, 1975, Pat. No. 4,128,504, which is a continuation-in-part of Ser. No. 329,800, Feb. 5, 1973, abandoned. This application Aug. 16, 1978, Ser. No. 934,234

Int. Cl.[2] B01J *29/28;* **C07C** *15/02*

U.S. Cl. 208—135 **12 Claims**

1. A process for converting a C_2-C_{10} hydrocarbon feed consisting essentially of paraffins, olefins or their mixtures comprising contacting a charge thereof with a zeolite-containing catalyst, said zeolite having a silica to alumina ratio of at least about 12 and a constraint index of from about 1 to about 12, and containing from about 0.1% to about 5% by weight of zinc and from about 0.1% to 2% by weight of another metal selected from the group consisting of metals of Groups IB and VIII of the Periodic Table, germanium, rhenium and rare earth metals.

4,157,294

METHOD OF PREPARING BASE STOCKS FOR LUBRICATING OIL

Yozo Iwao, Sodegaura; Susumu Yamamoto, Yokohama, and Takatoshi Kunihiro, Sodeguara, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Continuation of Ser. No. 738,325, Nov. 2, 1976, abandoned. This application May 19, 1978, Ser. No. 907,774

Int. Cl.[2] C10G *23/00, 34/00*

U.S. Cl. 208—264 **7 Claims**

1. A method for preparing a base stock for lubricating oil having excellent thermal and sunlight stability, consisting essentially of the steps of:

(1) vacuum distilling a topped crude oil and collecting a distillate (i) thereof,

(2) extracting said distillate (i) with a solvent having an affinity for aromatic hydrocarbons to obtain a raffinate and a solvent extract, said solvent extract having a total acid value of more than about 8,

(3) neutralizing said extract with an alkali to form a neutralized extract having a total acid value of less than 2.0,

(4) forming a mixture of from 10 to 60 percent of said neutralized extract and from 90 to 40 percent of a distillate (ii) of a topped crude oil, said distillate (ii) having a total acid value of less than 2.0, and

(5) hydrofinishing said mixture formed in (4).

4,157,295

METHOD AND APPARATUS FOR TESTING AND SEPARATING MINERALS

Delbert I. Liller, Rte. 4, Box 64, Deer Park, Md. 21550

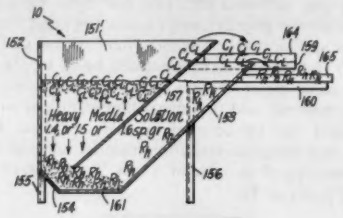
Filed Dec. 14, 1977, Ser. No. 860,331

Int. Cl.[2] B03B *1/04, 5/40*

U.S. Cl. 209—5 **4 Claims**

3. In a sink-float separation process wherein finely divided solid mineral materials tend to form flocs due to inert matter therein and which contains a plurality of components of different densities and specific gravities are separated by employing a parting liquid of perchloroethylene of intermediate density or specific gravity with respect to said solid materials, the improvement which comprises providing lead free gasoline as a dispersant in an amount of about 1.5% to about 13.4% by weight of the mixture of perchloroethylene and gasoline and said white gasoline serving as the sole surfactant soluable in said parting liquid; and

thereafter mixing with a stirring rod to distribute said solid materials in a trapezoidally shaped testing tank fitted with a baffle for the purpose of separating sinks from floats, the sinks being pushed under the baffle to a heavy side of the



tank and away from the floats whereby floc-formation is reduced to a minimum.

4,157,296

FLOTATION PROCESS FOR FLUORIDE MINERALS

Wim Dorrepaal, and Gerardus M. Van den Haak, both of Bodegraven, Netherlands, assignors to Chem-Y Fabriek van Chemische Produkten B.V., Bodegraven, Netherlands

Filed Jul. 11, 1977, Ser. No. 815,025

Claims priority, application United Kingdom, Jul. 16, 1976, 29736/76

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—167 **10 Claims**

1. A process for the flotation of fluoride minerals, from an ore which also contains barite, using a collector which possesses a high effectivity for fluoride and while depressing the barite, comprising adding to the flotation pulp a minor amount sufficient to depress barite of a substance selected from the group consisting of anionic vinyl sulfonic acid polymers and anionic allyl sulfonic acid polymers, which are not hydrophobic and which do not contain functional groups which interfere with the desired flotation.

4,157,297

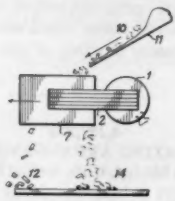
NON-FERROUS METAL SEPARATION BY INDUCED ATTRACTION SYSTEM AND DEVICE

Max Alth, 6 Tamarack Rd., Port Chester, N.Y. 10573

Filed Oct. 31, 1974, Ser. No. 519,520

Int. Cl.[2] B03C *1/26*

U.S. Cl. 209—212 **2 Claims**



1. A device for separating a mixture of non-ferrous metals that are conductive and non-conductive, non-ferrous materials comprising a solenoid coil wound on a highly permeable ferrous core such as iron, shaped like the letter U, having generally parallel core arms, a pair of non-ferrous, highly conductive metal plates with low magnetic susceptibility such as aluminum and copper, said plates being positioned and fastened to the facing sides of said U-shaped core arms, said plates to be generally equal in size, generally parallel to each other, spaced a distance apart and said plates to be larger in in length and width than said facing core arms to which the plates are fastened, means for feeding said mixture into a path defined by an air gap between said conductive plates, means for energizing said solenoid with alternating current so that the alternating

magnetic field produced between the arms of said U-shaped core induces eddy currents in said conductive plates as well as said conductive non-ferrous metals placed in said path that generate a magnetic field that coacts with said field produced in said arms to propel said conductive metals toward the ends of said plates and out of said path.

4,157,298

METHOD FOR THE REMOVAL OF FERRIC IONS FROM A CONCENTRATED AQUEOUS ZINC SOLUTION

Gerrit H. van den Berg, Amsterdam; Wilhelmus Pannekeet, Haarlem; Kees Koerts, Driebergen, and Robert Smakman, Nigtevecht, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 705,644, Jul. 15, 1976, abandoned. This application Dec. 23, 1977, Ser. No. 863,985

Claims priority, application Netherlands, Jul. 18, 1975, 7508614

Int. Cl.[2] C02B *1/52*

U.S. Cl. 210—30 R 7 Claims

1. A process for the removal of ferric ions from a concentrated aqueous solution containing zinc and ferric ions and having a pH value in the range of about 0 to 1.3, which comprises contacting said solution with a cation exchanger containing aminocarboxylic acid groups, iminodicarboxylic acid groups, or mixtures thereof, to remove ferric ions from the solution while removing substantially no zinc ions.

4,157,299

TWO-PHASE FILTER AND THIN LAYER CHROMATOGRAPHY PROCESS

Robert A. Landowne, Westport, Conn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 22, 1976, Ser. No. 651,670

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—31 C 4 Claims

1. A method for detecting filterable materials in gases or liquids which comprises the steps of collecting a gas or liquid sample on the unteated portion of a medium consisting of a support material having from about 75% to about 90% of its surface area continuously treated with an absorbent, contacting the collected sample with a developing solvent of substantial acrylonitrile-benzene-petroleum ether mixture, allowing the sample to chromatograph, and analyzing the resultant developed chromatogram.

4,157,300

PROCESS FOR THE PURIFICATION OF PHENOL AND PHENOL FORMALDEHYDE CONTAINING WASTE WATER

Helmut Junkermann, and Volker Hafner, both of Frankfurt, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Dec. 2, 1977, Ser. No. 857,356

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657192

Int. Cl.[2] C02B *1/14, 1/36*

U.S. Cl. 210—40 12 Claims

1. In a process for purifying waste water containing phenol with chlorine dioxide, the improvement comprising treating the waste water with alkali or alkaline earth metal chlorite in the presence of formaldehyde, the weight ratio of formaldehyde to phenol being between 0.5 to 2:1 and the molar ratio of the sum of phenol+formaldehyde to chlorite being between 1:1.2 to 1:2 when the chlorite is an alkali metal chlorite and being between 1:0.6 to 1:1 when the chlorite is an alkaline earth metal chlorite whereupon the treated waste water is decolorized.

4. The process of claim 1 wherein after treating the waste water with the chlorite it is treated with decolorizing carbon.

4,157,301

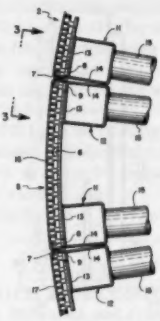
DRUM CONSTRUCTION FOR ROTARY DRUM FILTER

Willi A. Wegener, Salt Lake City, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Mar. 15, 1978, Ser. No. 886,837

Int. Cl.[2] B01D *33/08*

U.S. Cl. 210—404 2 Claims



1. A filter drum comprising a cylinder equipped with trunnions on opposite ends and having its curved outer wall surface divided by longitudinally extending division strips into a plurality of filter sectors extending end to end of said drum, a flange at each end of said drum closing the ends of said sectors, a plurality of ports in one of said trunnions extending axially therethrough, a plurality of slots in the surface of said drum spaced apart along at least one side of each of said sectors close and parallel to said division strips, at least one manifold extending the length of the inner wall of said drum located under one side edge of each said sector, said manifold being a closed conduit having a flat wall adjacent said inner wall of said drum and being secured thereto, slots in the top wall of said manifold in registration with said slots in said drum, means sealingly connecting the peripheral edges of said slots in said manifold with the peripheral edges of said slots in said drum, said manifold being connected by a single conduit to a port in one of said trunnions, and said manifold being secured directly to the inner wall of said drum.

4,157,302

METHOD AND APPARATUS FOR TREATING LIQUID-CONTAINING SUBSTANCE MIXTURES, PARTICULARLY FIBRE SUSPENSIONS

Karl E. Bergstedt, Timrå, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

Filed Nov. 21, 1977, Ser. No. 853,038

Claims priority, application Sweden, Dec. 6, 1976, 7613659

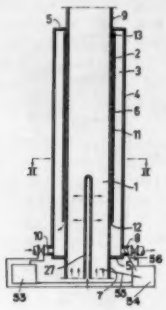
Int. Cl.[2] B01D *29/20, 29/38*

U.S. Cl. 210—81 57 Claims

1. A method for the treatment of liquid-containing substances comprising contacting said liquid-containing substance with separating means as said liquid-containing substance flows in a first direction so that at least a portion of said liquid can be separated from said liquid-containing substance through said separating means as said liquid-containing substance continues to flow in said first direction, said separating means being disposed substantially parallel to said first direction, withdrawing said liquid from said liquid-containing substance through said separating means in a second direction said second direction being substantially perpendicular to said first direction, intermittently interrupting the flow of said liquid downstream from the point of withdrawal of said liquid from said separating means so as to terminate the flow of said liquid through said separating means, and preventing the return flow of at least a portion of said liquid separated from said liquid-

containing substance through said separating means during said intermittent interruptions in the flow of said liquid.

13. Apparatus for treating a liquid-containing substance comprising means for directing the flow of said liquid-containing substance in a first direction, separating means substantially parallel to the flow of said liquid-containing substance in said first direction for separating at least a portion of said liquid



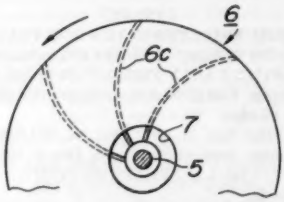
from said liquid-containing substance in a second direction, said second direction being substantially perpendicular to said first direction, means for interrupting the flow of said liquid separated from said liquid-containing substance at a point downstream of said separating means in said second direction, and means for preventing the return flow of at least a portion of said liquid through said separating means during said interruption of said flow of said liquid.

4,157,303

BIOLOGICAL WASTE WATER TREATMENT APPARATUS AND A METHOD OF PRODUCING THE SAME

Norihiro Yoshikawa, Yokohama, and Ryoji Suzuki, Mishima, both of Japan, assignors to Dengyosha Machine Works, Ltd., Japan

Filed Dec. 28, 1977, Ser. No. 865,244
Claims priority, application Japan, Aug. 23, 1977, 52-100128
Int. Cl.[2] B01D *21/00*
U.S. Cl. 210—150 **12 Claims**



1. A biological waste water treatment apparatus for purification of waste water retained in a tank, said apparatus comprising, at least one rotating disc assembly carried on a main shaft and adapted to be rotatively driven, the discs having lower halves immersed in the waste water retained in the tank, said rotating disc assembly including a plurality of centrifugal impellers arranged in parallel side by side relationship on said shaft, each said centrifugal impeller including two parallel discs, a plurality of radial blades positioned between the parallel discs, one of said discs being formed at its center with a suction opening.

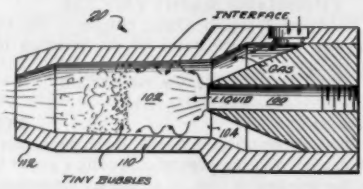
8. A method of producing a rotating disc assembly for a waste water treatment apparatus, said rotating disc assembly including impellers, each impeller comprising two parallel discs fixed to a main shaft, one of said discs being formed at its center with a suction opening and impeller blades radial to said main shaft between said two discs, comprising steps of providing dies including therein a cavity corresonding to a configuration of a sector surrounded by said impeller blades, pouring a molten synthetic resin through an inlet nozzle into said dies, blowing air under a determined pressure into said dies through an air blow pipe inserted in the interior of said dies to form an integral sector member including main and side discs and impeller blades, clamping a number of said sector members arranged side by side at a determined interval to form a sector block, and arranging said sector blocks about said main shaft and fixing them thereto.

4,157,304

AERATION METHOD AND SYSTEM

Allen E. Molvar, Barrington, R.I., assignor to Clevepak Corporation, White Plains, N.Y.

Filed Dec. 22, 1977, Ser. No. 863,588
Claims priority, application Japan, Nov. 22, 1977, 52-140555
Int. Cl.[2] B01F *3/04*; C02C *1/08*
U.S. Cl. 210—220 **12 Claims**

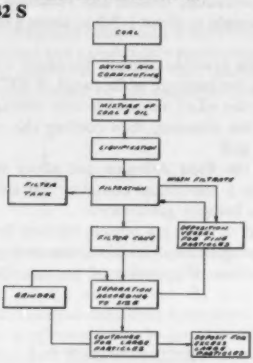


1. A system for aerating waste water comprising:
means for containing a body of water;
at least one mixing chamber for providing a waste water passage, including:
an extending chamber,
a liquid passage of guiding waste water flow into said extending chamber, the cross-sectional area of the liquid passage at the connection of said extending chamber being less than the cross-sectional area of said extending chamber at that connection so as to form a step surface, and said extending chamber having a first section tapering inwardly at a first rate in the direction away from said connection, and a second section extending from said first section and tapering inwardly at a rate greater than said first rate to maintain vortices within said extending chamber,
means defining at least one gas passage terminating in said step surface for injecting gas into said extending chamber, to form parallel gas and water streams, said extending chamber extending downstream from said gas passage for confining flow of the parallel gas and water streams for a distance until the interface between said streams becomes unstable in said chamber and vortices are tripped to produce gas bubbles which are mixed with the water stream;
means for pumping said waste water through said at least one mixing chamber;
means for mounting said mixing chamber below the surface of said body of water; and
means for injecting an aerating gas into waste water within said mixing chamber.

4,157,305
METHOD OF FILTERING MOLTEN COAL

Hans Müller, Erlenbach, Switzerland, assignor to Chemap AG, Maennedorf, Switzerland

Continuation-in-part of Ser. No. 696,589, Jun. 16, 1976, abandoned. This application Dec. 1, 1977, Ser. No. 856,598
Claims priority, application Switzerland, Jun. 20, 1975, 8106/75
Int. Cl.[2] B01D *41/00*
U.S. Cl. 210—42 S **11 Claims**



1. A process for filtering molten coal, comprising the steps of providing a filter vessel including a filter; contacting said filter with a filter aid comprising at least one member of the group consisting of inorganic salts, calcium oxide and magnetic metal granulates; passing a stream of molten coal which includes some solid material against said filter and filtering the solid material so as to form a filter cake on and to pass a filtrate through said filter; directing a spray or jet of chemically unreactive gas against said filter cake so as to dry the same to a predetermined low moisture content; centrifuging said dried filter cake off said filter; separating from the filter cake a fraction composed of fine particles of said filter aid; adding said separated fine particles of said filter aid to a stream of molten coal upstream of said filter; and passing said stream of molten coal and separated fine particles of said filter aid against said filter, whereby said fine particles act as a recycleable filter aid for the filtration of the molten coal.

4,157,306
TERTIARY OIL RECOVERY PROCESS UTILIZING A PREFLUSH

George Kalfoglou, Houston, and Kenoth H. Flournoy, Levelland, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 718,993, Aug. 30, 1976. This application Jan. 9, 1978, Ser. No. 867,747
Int. Cl.[2] E21B *43/22*
U.S. Cl. 252—8.55 D **3 Claims**

1. An aqueous preflush fluid for injection into a subterranean petroleum containing formation containing saline water consisting essentially of a mixture of water having a salinity less than that of the formation water, about 0.05 to about 0.6 percent by weight of colloidal silica having a particle size from about 7 to 15 millimicrons and about 10 to about 1000 parts per million of a random, linear water-soluble friction reducing polymer of a monomer or monomers consisting essentially of from about 1 to about 100 percent by weight of (3-acrylamido-3-methyl) butyl trimethyl ammonium chloride and from 0 to about 99 percent by weight of acrylamide.

4,157,307
LIQUID FABRIC SOFTENER

Mark S. Jaeger, and James E. Davis, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 7, 1978, Ser. No. 931,588
Int. Cl.[2] D06M *13/34*
U.S. Cl. 252—8.75 **8 Claims**

1. A liquid fabric conditioning composition comprising
(a) from about 3% to about 12% by weight of the composition of cationic fabric conditioning agent comprising
(i) quaternary ammonium salt, and (ii) quaternary imidazolinium salt, wherein the weight ratio of (i):(ii) is from about 1:1.5 to about 4:1;
(b) from about 0.2% to about 1.3% by weight of the composition of protonated di-polyethoxy monoalkyl amine;
(c) from about 1% to about 6% by weight of the composition of a lower alcohol; and
(d) water; wherein the pH is from about 3.5 to about 5.5.

4,157,308
MANNICH BASE COMPOSITION

Donovan R. Wilgus, Richmond, and John M. King, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 756,569, Jan. 3, 1977. This application Sep. 30, 1977, Ser. No. 838,329
Int. Cl.[2] C10M *1/54*
U.S. Cl. 252—42.7 **10 Claims**

1. A Mannich base condensation product and the alkaline earth metal salts thereof selected from the group consisting of
(A) the Mannich base prepared by condensing formaldehyde and a polyamine with a phenolic mixture consisting of
(1) from 95 to 30% phenol alkylated with a propylene tetramer, and
(2) from 5 to 70% phenol alkylated with a straightchain alpha-olefin of from 16 to 28 carbon atoms or alpha-olefin mixtures wherein the olefins are of from 16 to 28 carbon atoms, and
(B) the alkaline earth metal salts thereof.

4. A lubricating oil composition comprising an oil of lubricating viscosity and from 0.1 to 40% by weight of the condensation product or an alkaline earth metal salt thereof of claim **1.**

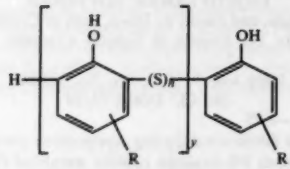
8. a process for preparing a Mannich base condensation product or an alkaline earth metal salt thereof which comprises condensing 0.5 to 0.85 mol formaldehyde, at least 0.3 mol of a polyamine, and 1.0 mol of a phenolic mixture consisting of
(1) from 95 to 30% phenol alkylated with propylene tetramer, and
(2) from 5 to 70% phenol alkylated with a straight-chain alpha-olefin of from 16 to 28 carbon atoms or alpha-olefin mixtures wherein the olefins are of from 16 to 28 carbon atoms, and, optionally, forming the alkaline earth metal salt thereof by treating the Mannich base with an alkaline earth metal hydroxide in the presence of a promotor.

4,157,309
MANNICH BASE COMPOSITION

Donovan R. Wilgus, Richmond, and John M. King, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 30, 1977, Ser. No. 838,197
Int. Cl.[2] C10M *1/54*
U.S. Cl. 252—42.7 **11 Claims**

1. A Mannich base condensation product selected from the group consisting of
(A) the Mannich base condensation product prepared by condensing formaldehyde and a polyamine with a sulfur-containing phenolic mixture consisting of (1) from 5 to 35 mol percent of a sulfurized alkylphenol of the formula

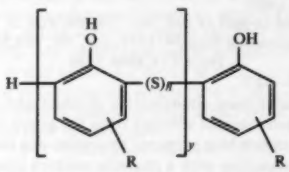


wherein R is C_8–C_{36} alkyl, n is an integer from 1 to 8, and y is an integer from 1 to 9, and (2) from 95 to 65 mol percent of phenol alkylated with a propylene tetramer, and

(B) the alkaline earth metal salts thereof.

4. A lubricating oil composition comprising an oil of lubricating viscosity and from 0.1 to 50% by weight of the condensation product or an alkaline earth metal salt thereof of claim **1**.

9. A process for preparing a Mannich base condensation product or an alkaline earth metal salt thereof which comprises condensing 0.5 to 0.85 mol formaldehyde, at least 0.3 mol of a polyamine, and 1.0 mol of a sulfur-containing phenolic mixture consisting of (1) from 5 to 35 mol percent of a sulfurized alkylphenol of the formula



wherein R is C_8–C_{36} alkyl, n is an integer from 1 to 8, and y is an integer from 1 to 9, and (2) from 95 to 65 mol percent of phenol alkylated with propylene tetramer, and, optionally, forming the alkaline earth metal salt thereof by treating the Mannich base with an alkaline earth metal hydroxide in the presence of a promoter.

4,157,310

CONSTANT BOILING ADMIXTURES

William M. Hutchinson, deceased, late of Bartlesville, Okla., and by Florence M. Hutchinson, executrix, Claremore, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 783,243, Mar. 31, 1977, Pat. No. 4,097,398, which is a division of Ser. No. 690,807, May 27, 1976, Pat. No. 4,039,465, which is a division of Ser. No. 602,353, Aug. 6, 1975, Pat. No. 4,024,086. This application Dec. 28, 1977, Ser. No. 865,163

Int. Cl.[2] **C23G** *5/02*

U.S. Cl. 252—364 **3 Claims**

1. A substantially constant boiling admixture of (A) 1,1,2-trifluoroethane and (B) 1,1,2-trichloro-1,2,2-trifluoroethane wherein said (A) represents about 89.5 weight percent, and said (B) about 10.5 weight percent, at substantially atmospheric pressure.

4,157,311

METHOD OF MAKING A HALOGEN SENSOR

Edward D. Orth, Boxford, and William J. Schultz, Lynnfield, both of Mass., assignors to General Electric Company, New York, N.Y.

Filed Sep. 1, 1977, Ser. No. 829,899

Int. Cl.[2] **C01N** *27/62;* **C09K** *3/00;* **H01J** *7/24*

U.S. Cl. 252—408 **4 Claims**

1. A method of making a sensing mixture for a halogen gas sensor comprising an alkali metal carbonate dispersed throughout the interstices of granules of porous activated alumina having a large surface area, consisting essentially of the steps of:

(a) providing a batch of granular activated Alumina (Al_2O_3),

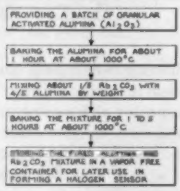
(b) placing the Alumina in a platinum crucible and baking it for about 1 hour at approximately 1,000° C., then cooling the crucible and its contents to ambient temperature,

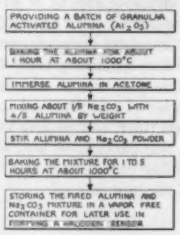
(c) placing at least one alkali metal carbonate powder selected from the group consisting of carbonates of sodium, lithium, potassium, cesium and rubidium in the crucible equal in weight to about 1/5th to about ½ the weight of the Alumina,

(d) baking the crucible contents for about 1 hour to about 5 hours at a temperature in the range of 900° C. to 1,200° C. to diffuse the alkali metal carbonate throughout the interstices of the alumina, then cooling the crucible and its contents, and

(e) storing the fired Alumina and alkali metal carbonate mixture in a vaportight container for subsequent use in forming a halogen gas sensor.

2. A method of making a sensing mixture for a halogen gas sensor comprising an alkali metal carbonate dispersed throughout the interstices of granules of porous activated alumina


PROVIDING A BATCH OF GRANULAR ACTIVATED ALUMINA (Al_2O_3)
BAKING THE ALUMINA FOR ABOUT 1 HOUR AT ABOUT 1000°C
MIXING ABOUT 1/5 Rb_2CO_3 WITH 4/5 ALUMINA BY WEIGHT
BAKING THE MIXTURE FOR 1 TO 5 HOURS AT ABOUT 1000°C
STORING THE FIRED ALUMINA AND Rb_2CO_3 MIXTURE IN A VAPOR FREE CONTAINER FOR LATER USE IN FORMING A HALOGEN SENSOR


PROVIDING A BATCH OF GRANULAR ACTIVATED ALUMINA (Al_2O_3)
BAKING THE ALUMINA FOR ABOUT 1 HOUR AT ABOUT 1000°C
IMMERSE ALUMINA IN ACETONE
MIXING ABOUT 1/5 Rb_2CO_3 WITH 4/5 ALUMINA BY WEIGHT
STIR ALUMINA AND Rb_2CO_3 POWDER
BAKING THE MIXTURE FOR 1 TO 5 HOURS AT ABOUT 1000°C
STORING THE FIRED ALUMINA AND Rb_2CO_3 MIXTURE IN A VAPOR FREE CONTAINER FOR LATER USE IN FORMING A HALOGEN SENSOR

having a large surface area, consisting essentially of the steps of:

(a) providing a batch of granular activated Alumina (Al_2O_3),

(b) placing the Alumina in a platinum crucible and baking it for about 1 hour at approximately 1,000° C. then cooling the crucible and its contents to ambient temperature,

(c) placing at least one alkali metal carbonate powder selected from the group consisting of sodium carbonate and rubidium carbonate in the crucible equal in weight to about ½th the weight of the Alumina,

(d) covering the contents of the crucible with acetone,

(e) stirring the contents of the crucible sufficiently to expose the Alumina granules to the alkali metal carbonate, taking care not to reduce the size of the Alumina granules during the stirring operation,

(f) baking the crucible contents for about 1 hour at approximately 1,000° C. to diffuse the alkali metal carbonate throughout the interstices of the alumina then cooling the crucible and contents, and

(g) storing the fired Alumina and alkali metal carbonate mixture in a vapor-tight container for subsequent use in forming a halogen gas sensor.

4,157,312

CATALYTIC COMPOSITE PARTICULARLY USEFUL FOR THE OXIDATION OF MERCAPTANS CONTAINED IN A SOUR PETROLEUM DISTILLATE

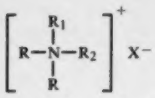
Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 880,723, Feb. 24, 1978, Pat. No. 4,124,493. This application Jul. 24, 1978, Ser. No. 927,317

Int. Cl.[2] B01J *31/12*

U.S. Cl. 252—428 **18 Claims**

1. A catalytic composite comprising a metal chelate mercaptan oxidation catalyst and a quaternary ammonium salt impregnated on a solid adsorptive support, said quaternary ammonium salt being represented by the structural formula



wherein R is a hydrocarbon radical containing up to about 20 carbon atoms and selected from the group consisting of alkyl, cycloalkyl, aryl, alkaryl and aralkyl, R_1 is a substantially straight chain alkyl radical containing from about 5 to about 20 carbon atoms, R_2 is selected from the group consisting of aryl, alkaryl and aralkyl, and X is an anion selected from the group consisting of chloride, bromide, iodide, fluoride, nitrate, nitrite, sulfate, phosphate, acetate, citrate and tartrate.

4,157,313

COMPOSITE SUPPORT NOTABLY FOR SUPPORTING CATALYSTS CONTAINING A METAL

Jean Conan, Gelos; Marie-France Llauro nee Darricades, Rillieux; Michel Bartholin, Villeurbanne, and Alain Guyot, Lyons, all of France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine, France

Continuation of Ser. No. 661,213, Feb. 25, 1976, abandoned. This application Dec. 2, 1977, Ser. No. 857,536

Claims priority, application France, Feb. 26, 1975, 75 06057

Int. Cl.[2] B01J *31/16, 31/18, 31/24*

U.S. Cl. 252—431 P **17 Claims**

1. In a catalyst comprising a catalytic metal of a coordination complex, said coordination complex being bound onto a solid insoluble support by means of at least one of its coordinates, said coordinates being one of the group consisting of amino, carbonyl, cyano, halogen, diene, cyclodiene, stibine, arsine and phosphine, the improvement wherein the support is covered at least partially by a polysiloxane bearing an organic group, said coordination complex being bound to said polysiloxane through said organic group.

4,157,314

GRANULAR ACTIVATED CARBON MANUFACTURE FROM SUB-BITUMINOUS COAL TREATED WITH DILUTE INORGANIC ACID: DIRECT ACTIVATION METHOD

Hari N. Murty, Grand Island, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed Mar. 6, 1978, Ser. No. 884,085

Int. Cl.[2] C01B *31/08, 31/10, 31/14;* **B01J** *21/18*

U.S. Cl. 252—444 **20 Claims**

1. A process for making hard granular activated carbon having a minimum abrasion number of about 70 comprising:

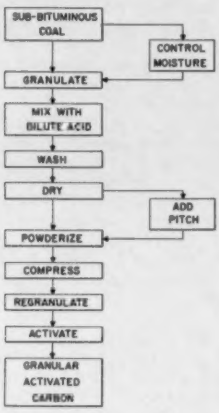
forming granules from sub-bituminous coal;

treating the granules with a dilute aqueous solution of inorganic acid, at a concentration from about 1 to about 25% by weight, to reduce the volatile content and thereby increase the fixed carbon content comprising: mixing the granules with the acid for a time and at a temperature and solution to coal ratio sufficient for further processing, washing off the acid, and drying the granules at least partially to a moisture content below about 25% by weight;

mixing the treated granules with from 0 to about 15% by weight of a carbonaceous binder;

reducing the treated granules to form fine powder;

compressing the powder to form shapes;



reducing the shapes to reform granules;

and thereafter directly activating the reformed granules, without charring and devolatilizing, by directly heating to and at a temperature higher than the devolatilizing temperature in an atmosphere containing a gaseous activating agent.

4,157,315

METHOD OF PREPARING A SUPPORTED CATALYST AND THE CATALYST PREPARED BY THE METHOD

Harold T. Michels, Congers, and Raymond P. Jackson, Suffern, both of N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Dec. 21, 1973, Ser. No. 427,243

Int. Cl.[2] B01J *21/08, 23/26, 23/72, 23/74*

U.S. Cl. 252—458 **24 Claims**

1. A method of preparing a supported catalyst comprising a structural substrate having an adherent, coating of a catalytic material thereon, comprising:

(a) applying on the substrate a dispersion comprising a stabilized colloidal silica solution having dispersed therein a fine metal powder, said metal powder consisting essentially of at least two metals selected from nickel, chromium and copper, and said metal powder consisting essentially of at least one of the group: a mixture of at least two of said metals in elemental form, an alloy of at least two of said metals, a mixture containing at least one of said metals in elemental form with one or more of said alloys, and

(b) firing the coated substrate in a protective atmosphere at an elevated temperature in the range of from about 1400° F. to below the melting point of the lowest melting component for a period of time sufficient to sinter the metal powder and to provide a thin, adherent, coherent, coating containing silica and an effective amount of catalytically active material.

4,157,316
POLYFUNCTIONAL CATALYSTS

Charles E. Thompson, Warren; John J. Mooney, Wyckoff; Carl D. Keith, Summit, all of N.J., and William A. Mannion, San Francisco, Calif., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Continuation-in-part of Ser. No. 608,084, Aug. 27, 1975, abandoned. This application Sep. 16, 1977, Ser. No. 833,922
Int. Cl.[2] B01J *21/04, 23/10, 23/64, 23/74*
U.S. Cl. 252—462 **16 Claims**

1. A catalyst suitable for simultaneously oxidizing gaseous hydrocarbons and carbon monoxide and reducing nitrogen oxides, consisting essentially of

(a) a support consisting essentially of alumina;

(b) platinum group metal component, the platinum group metal being selected from the group consisting of platinum plus at least one of rhodium, ruthenium, iridium and mixtures thereof, and alloys of said platinum group metals;

(c) a base metal oxide component, the base metal being selected from the group consisting of metals having an atomic number from 25 to 28 and rhenium, and mixtures thereof, said base metal oxide being present in a weight ratio of said platinum group metal component of at least 2 to 1 and;

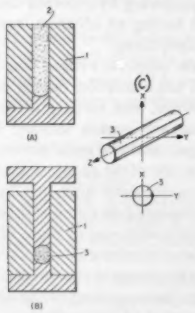
(d) a carrier on which said support, composited with both said platinum group metal component and said base metal oxide component are deposited;

(e) said catalyst being prepared by combining said platinum group metal component, said base metal oxide component, and said support by impregnating said support in particulate form with the following compounds in aqueous solution: a compound of said base metal, a compound of platinum; and one or more of a compound of rhodium, a compound of ruthenium, or a compound of iridium; the resulting impregnated support being deposited on said carrier by contacting said carrier with an aqueous dispersion of particles of said impregnated support, and heating said impregnated support at a temperature sufficiently high to provide on said carrier a composite of said platinum group metal component, said base metal oxide component and said support.

4,157,317
RESIN-BONDED GRAPHITE BODY FOR A DRY BATTERY AND METHOD OF MAKING THE SAME

Masahiro Nagasawa; Tomio Ishida, both of Hirakata, and Yoshitaka Yoshikawa, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 711,377, Aug. 3, 1976, Pat. No. 4,094,897. This application Jan. 6, 1978, Ser. No. 867,606
Claims priority, application Japan, Aug. 12, 1975, 50-98207
Int. Cl.[2] H01B *1/06*
U.S. Cl. 252—511 **3 Claims**

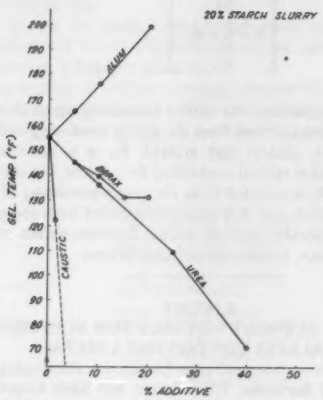


1. A resin-bonded graphite body having controlled crystalline orientation and a density of at least 2.05 g/cm^3, said body comprising 3 to 12 weight % of a thermosetting resin and 88 to 97 weight % of a carbonaceous powder which includes at least 50 weight % of natural crystalline graphite powder having an average particle size between 50 and 150 microns.

4,157,318
STARCH CARRIER COMPOSITION FOR ADHESIVE CONTAINING UREA AS A SELATINIZING AGENT

Alexander Sadle, Morristown, N.J., and Thomas J. Pratt, Chester, N.Y., assignors to International Paper Company, New York, N.Y.

Filed Aug. 2, 1977, Ser. No. 821,257
Int. Cl.[2] C08L *3/02*
U.S. Cl. 260—17.2 **19 Claims**



1. In an adhesive composition adapted for use as a bonding agent for corrugated paperboard upon being subjected to heat in situ, a carrier comprising 1 part gelatinized amylaceous material, between about 3 and 5 parts water, and between about 0.5 and 4 parts urea, said carrier, in the absence of caustic, being adapted to reduce the temperature at which bonding will take place to within the range of about 140°–155° F.

4,157,319
ADHESIVE COMPOSITION AND BUTADIENE, STYRENE, ACRYLONITRILE COPOLYMER THEREFOR

George W. Feeney, Akron, and Gary L. Burroway, Doylestown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 688,642, May 21, 1976, Pat. No. 4,052,483, which is a division of Ser. No. 528,299, Nov. 29, 1974, Pat. No. 3,970,623. This application Jun. 6, 1977, Ser. No. 803,490
Int. Cl.[2] C08L *7/00, 51/00, 47/00, 53/00*
U.S. Cl. 260—27 BB **3 Claims**

1. A pressure sensitive adhesive composition which comprises an admixture of (A) 100 parts by weight of the copolymer of butadiene, styrene and acrylonitrile and (B) about 50 to about 150 parts by weight of a tackifying resin selected from at least one of rosin esters and diolefin/olefin copolymers containing 5 to 35 weight percent aromatic units; where said tackifying resin is selected from hydrogenated rosin esters having an acid number of less than about 10 and from diolefin-olefin resins prepared by polymerizing in the presence of a catalyst selected from aluminum chloride and ethylaluminum dichloride, a monomer mixture comprised of piperylene along with at least one methyl branched chain α or β monoolefin containing 4 to 6 carbon atoms, where the mole ratio of diolefin to monoolefin is in the range of about 0.8/1 to about 2/1, in combination with about 10 to about 35 weight percent of at least one monomer selected from styrene and α-methyl styrene and about 0 to about 10 weight percent dicyclopentadiene,

based on the total monomer mixture; and where said butadiene, styrene and acrylonitrile copolymer is characterized by having an ultimate tensile strength in the range of about 50 to about 100 pounds per square inch and an ultimate elongation in the range of about 600 to about 1200 percent at 25° C., and further characterized by a Mooney plasticity of about 25 to about 85, a benzene solution viscosity at a 4 weight percent concentration at 25° C. of about 10 to about 100 centipoises and a hexane solution viscocity at a 10 weight percent concentration at 25° C. of about 200 to about 2000 centipoises, prepared by the method which comprises (1) aqueous emulsion free radical polymerizing in the presence of a modifier composed of primary and/or tertiary mercaptans, a monomer mixture comprising about 3 to about 8 weight percent styrene, about 97 to about 92 weight percent 1,3-butadiene and about 1 to about 4 weight percent acrylonitrile based on 100 weight percent monomer mixture to a conversion of about 50 to about 75 weight percent of said monomers to a copolymer thereof, and (2) reacting an additional amount of about 2 to about 5 weight percent styrene, based on the total monmers used, with said copolymer to an extent of about 80 to about 98 weight percent conversion of the total monomers to a copolymer thereof, with additional mercaptan modifier.

4,157,320
RUBBER PROCESSING AID

Paul R. Yankner, Englewood, and Nelson N. Schwartz, Teaneck, both of N.J., assignors to Technical Processing, Inc., Paterson, N.J.

Filed Mar. 20, 1978, Ser. No. 888,605
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 A **10 Claims**

1. A solid, free-flowing particulate rubber processing aid for natural or synthetic rubber, said processing aid comprising petrolatum absorbed on clay, the proportion of petrolatum to clay being from about 1:4 to about 4:1.

7. In a method for compounding natural or synthetic rubber wherein said rubber is milled with vulcanizing agents and other conventional additives prior to formation of a finished rubber article, the improvement which comprises charging a rubber processing aid according to claim 1 to the rubber compound prior to the molding step in an amount sufficient to impart improved mill and mold release and improved flow properties to the rubber compound during shaping.

4,157,321
STABILIZED POLYMERIC ORGANOSILANE COMPOSITIONS

James H. Kawakami, Piscataway; Robert J. Ward, Bridgewater, and Neil J. McCarthy, Warrenville, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 18, 1978, Ser. No. 925,844
Int. Cl.[2] C08K *5/54*
U.S. Cl. 260—29.1 SB **4 Claims**

1. A stabilized polymeric organosilane composition comprising:

(A) a polymeric organosilane compound having copolymerized therein

(1) from 99.5 to 75 mole percent of an ethylenically unsaturated organic monomer and

(2) from 0.5 to 25 mole percent of an unsaturated organosilane of the formula $RSiX_nR'_{(3-n)}$ wherein R is a monovalent organic radical containing a vinyl group, R' is a monovalent hydrocarbon radical containing up to 10 carbon atoms, n is an integer from 1 to 3, and X is a hydrolyzable group chosen from the group consisting of alkoxy of 1 to about 4 carbon atoms, alkoxyalkoxy containing up to about 6 carbon atoms, acyloxy of 2 to about 4 carbon atoms, phenoxy, and oxime;

(B) from 0.5 to 25 parts by weight, per 100 parts of said polymeric organosilane compound, of a compound chosen from the group consisting of

(1) monomeric hydrolytically reactive organosilanes of the formula $R''_{(4-x)}SiX_x$ wherein X is a hydrolyzable group as previously defined, R'' is a monovalent organic radical containing 1 to 12 carbon atoms, and x is an integer from 1 to 4; and

(2) trialkyl orthoformates wherein said alkyl has 1 to 3 carbon atoms

(C) from 2 to 50 parts by weight, per 100 parts of said polymeric organosilane, of an alkyl alcohol having from 1 to 4 carbon atoms in the alkyl segment.

4,157,322
WATER DIVERTING GEL COMPOSITIONS

George T. Colegrove, San Diego, Calif., assignor to Merck & Co., Inc.,, Rahway, N.J.

Filed Jan. 19, 1978, Ser. No. 870,695
Int. Cl.[2] C08L *1/28*
U.S. Cl. 260—15 **2 Claims**

1. A composition of matter comprising water, 0.5 to 1.5% of a cross linkable polymer which is selected from the group consisting of cellulose, carboxymethyl cellulose, methyl cellulose, methyl hydroxy propyl cellulose, hydroxy ethyl cellulose, xanthan gums, guar gums, locust bean gums, gum tragacanths or alginates; 0.1–0.5% of an acid generating salt which is selected from the group consisting of ammonium chloride, ammonium sulfate, ammonium nitrate, or ammonium phosphate monobasic; and 0.5–1.25% of a partially methylated melamine formaldehyde resin.

4,157,323
METAL CONTAINING POLYMERIC FUNCTIONAL MICROSPHERES

Shiao-Ping S. Yen; Alan Rembaum, both of Altadena, Calif., and Robert S. Molday, Vancouver, Canada, assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 694,151, Jun. 9, 1976, abandoned. This application Apr. 20, 1977, Ser. No. 789,268
Int. Cl.[2] C08K *3/10*
U.S. Cl. 260—29.7 M **21 Claims**

1. A composition comprising an aqueous suspension of small polymeric microspheres having a size of no more than 2000 A and containing a dispersion of 1 to 50% by weight of finely divided, metal containing particles having a size less than the resultant microspheres embedded within the microspheres and being selected from metals or metal compounds of electron dense metals having an atomic number above 50 or magnetically attractable metals and consisting essentially of the addition polymerizate of a monomer mixture consisting essentially of at least 20% by weight of a first ethylenically unsaturated acrylic monomer substituted with at least one covalent bonding functional group selected from amino, hydroxyl or carboxyl; 40% to 70% by weight of a sparingly water-soluble, compatible, unsaturated, second monomer having hydrophobic characteristics, and 1% to 20% by weight of a water-soluble, polyunsaturated, compatible diene or triene cross-linking agent.

4,157,324
HIGH ORTHO ETHERIFIED RESOLE RESINS ADMIXED WITH COREACTIVE RESINS

Harry M. Culbertson, Belchertown, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 763,763, Jan. 31, 1977, abandoned, which is a division of Ser. No. 647,958, Jan. 9, 1976, abandoned. This application Jun. 29, 1978, Ser. No. 920,597
Int. Cl.[2] C08G *8/36;* **C08L** *61/10, 61/14*
U.S. Cl. 260—32.8 R **15 Claims**

1. A high ortho etherified resole resin coating composition comprising a high ortho etherified resole resin and about 1 to 95% by weight of a coreactive resin, said high ortho etherified resole resin being characterized by:

A. having a reacted formaldehyde to phenol mol ratio of 1.10 to 2.0, said formaldehyde reacting with said phenol,

forming methylol groups taking a final orientation of about 90% to 100% in the ortho position,

B. having said phenol selected from the group consisting of phenol, meta-substituted phenols and mixtures of phenol and substituted phenols,

C. having condensed phenol-aldehyde linkages wherein 25 to 90% of said linkages are benzyl ether linkages having a final orientation essentially in the ortho position and 10 to 75% are methylene linkages taking a final orientation of about 70 to 90% in the ortho position and about 10 to 30% in the para position,

D. having an average degree of polymerization of less than 4.0, and

E. having said methylol groups partially etherified with monohydric alcohols, said etherified resoles being prepared by first reacting said phenol and said formaldehyde in an aqueous reaction mixture under reflux at about 80° C. to 100° C. in the presence of a divalent electropositive metal ion, while maintaining the pH in the range of about 4 to 7, wherein said pH is controlled by having a sufficient amount of an organic acid present, forming said resole in said reaction mixture, etherifying said resole with a monohydric alcohol at a temperature of 65° to 100° C., in said reaction mixture and dehydrating the resultant aqueous reaction mixture to a water content of less than about 1 weight percent and an alcohol content of less than about 5% by weight providing an etherified high ortho resole resin as a single phase clear liquid varnish.

4,157,325
PBT MOLDING COMPOSITIONS

John J. Charles, Bloomingdale, and Robert C. Gasman, West Milford, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jul. 11, 1977, Ser. No. 814,543
Int. Cl.[2] C08K *7/14, 7/20;* **C08L** *67/06*
U.S. Cl. 260—40 R **14 Claims**

1. Molding composition comprising at least about 30 wt% PBT having an intrinsic viscosity between about 0.5 and about 2.0 dl/g and containing:

a. between about 10 and about 50 wt% based on total weight of PBT molding composition of thermally stable glass reinforcing fibers having diameters between about 5 and about 20 microns and aspect ratios of at least about 5

b. between about 1 and about 40 wt% based on PBT of glass spheres having diameters between about 0.2 and about 20 microns and aspect ratios less than about 3, and

c. between about 5 and about 40 wt% based on total weight of PBT molding composition of poly(butylene terephthalate-co-tetramethylene oxide) having a Shore D hardness between about 50 and about 60 and a melt index between about 7 and about 9.

4,157,326
PREPARATION OF GLASS CONCENTRATE CAPSULES FOR REINFORCEMENT OF THERMOPLASTICS

Massimo Baer, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 28, 1977, Ser. No. 855,139
Int. Cl.[2] C08K *9/10*
U.S. Cl. 260—42.18 **25 Claims**

1. Glass concentrate capsules comprising a plurality of glass strand segments of length in the range of about 0.8 to about 20 mm. arranged in a substantially collimated array within a substantially water insoluble crystalline organic encapsulating agent of number average molecular weight of about 2000 or less, wherein the capsules contain from about 50 to about 90 percent by weight of glass and wherein each strand segment comprises a plurality of microfibers.

4,157,327
THERMALLY CONDUCTIVE CAULK

Ronald G. Martin, Chicopee Falls, Mass.; Joseph Powers, Riverside, and John C. Trocciola, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1977, Ser. No. 864,947
Int. Cl.[2] C08J *3/20;* **C08K** *3/04*
U.S. Cl. 260—42.27 **16 Claims**

1. A process for making an electrically conductive and thermally conductive caulk comprising the steps of:

forming a compound by (1) mixing together a stable aqueous dispersion of fluorinated ethylene propylene and a stable aqueous dispersion of PTFE to form a stable aqueous dispersion of fluorinated ethylene propylene and PTFE and (2) stirring into said dispersion of fluorinated ethylene propylene and PTFE an amount of particulate graphite at least sufficient to cause flocculation of all the fluorinated ethylene propylene and PTFE solids along with the graphite, the solids content of said compound comprising 50–70% by weight fluorinated ethylene propylene and PTFE combined and 30–50% graphite, the ratio of fluorinated ethylene propylene to PTFE being between 3:1 and 1:10;

drying the compound by heating below the initial melting point of fluorinated ethylene propylene; and

heating the dried compound to between 560° F. and 700° F.

4,157,328
SEALING MATERIAL ON THE BASIS OF POLYTETRAFLUOROETHYLENE FIBERS

Gerhard Beyer, Hofheim am Taunus, and Gerhard Wölfel, Pfungstadt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 15, 1977, Ser. No. 833,711
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1976, 2642086; Jul. 20, 1977, 2732709
Int. Cl.[2] C08K *3/04*
U.S. Cl. 260—42.27 **4 Claims**

1. A sealing material from polytetrafluoroethylene which consists essentially of an intimate mixture of at least 50% by weight of polytetrafluoroethylene of cut staple fibers having a length of 1 to 20 millimeters, from 10% to 30% by weight of graphite powder and from 5% to 25% by weight of finely divided polytetrafluoroethylene having an average particle size of 0.1 to 30 microns.

4,157,329
COPPER AND COBALT CARBONATES AS SMOKE SUPPRESSANTS FOR POLY(VINYL HALIDES)

Stanley R. Sandler, Springfield, Pa., and Donald A. Sheldon, Cranbury, N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 13, 1978, Ser. No. 869,074
Int. Cl.[2] C08K *3/26*
U.S. Cl. 260—45.75 C **11 Claims**

7. A process for preparing a smoke suppressant poly(vinyl halide) resin comprising mixing a poly(vinyl halide) resin with a sufficient amount to reduce smoking of a smoke suppressant selected from the group of copper carbonate, cobalt carbonate and a mixture thereof.

4,157,330

PROCESS FOR THE PRODUCTION OF CYCLIC DIESTERS OF DODECANEDIOIC ACID

Joern Rueter; Klaus Burzin; Karl-Heinz Magosch, and Roland Feinauer, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Division of Ser. No. 734,013, Oct. 19, 1976, Pat. No. 4,105,672.
This application Jan. 6, 1978, Ser. No. 867,566
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1975, 2547267
Int. Cl.[2] C07D *321/00*
U.S. Cl. 260—340.2 13 Claims

1. In a process for the production of a cyclic ester of dodecanedioic acid and an aliphatic diol of 2–12 carbon atoms and substituted by up to two alkyl of 1–4 carbon atoms, by thermolysis of a corresponding linear polyester under reduced pressure in the presence of a catalyst, the improvement which comprises conducting the thermolysis at a temperature of from 200° to 300° C., and employing as the catalyst a tin(II) salt of an aliphatic monocarboxylic acid of up to 18 carbon atoms, an aromatic or araliphatic monocarboxylic acid of up to 36 carbon atoms, or an aliphatic or aromatic hydroxy-, poly-, ketocarboxylic or dicarboxylic acid of up to 18 carbon atoms.

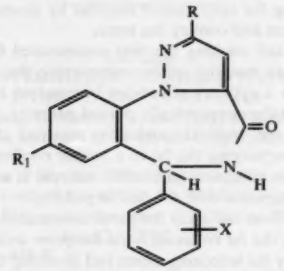
4,157,331

PYRAZOLO BENZODIAZEPINES

Norman Gilman, Wayne, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 775,346, Mar. 7, 1977, Pat. No. 4,130,716.
This application Sep. 14, 1978, Ser. No. 942,202
Int. Cl.[2] C07D *487/04*
U.S. Cl. 260—239.3 T 4 Claims

1. A compound of the formula



wherein X is hydrogen or halogen, R_1 is hydrogen or halogen and R is selected from the group consisting of CO_2R_5 and CH_2OR_6 wherein R_5 is lower alkyl and R_6 is acetyl.

4,157,332

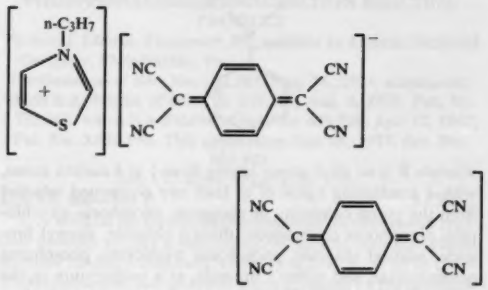
HEAT-SENSITIVE THIAZOLIUM-7,7,8,8-TETRACYANOQUINODIMETHANE SEMICONDUCTIVE MATERIALS

Mutsuaki Murakami, and Susumu Yoshimura, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 10, 1977, Ser. No. 805,342
Claims priority, application Japan, Jun. 11, 1976, 51/69052; Jun. 11, 1976, 51/69053; Jun. 11, 1976, 51/69055
Int. Cl.[2] C07D *277/22*
U.S. Cl. 260—302 R 3 Claims

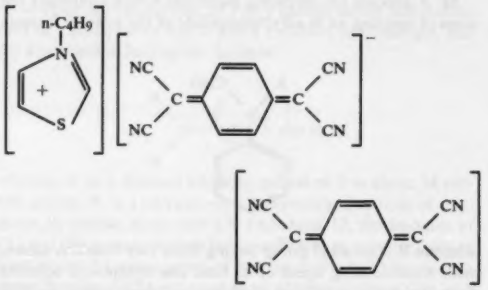
1. An organic heat-sensitive semiconductive material selected from the group consisting of:

(a) (N-n-propylthiazolium)$^+$(7,7,8,8-tetracyanoquinodimethane)$^-$(7,7,8,8-tetracyanoquinodimethane) expressed by the following formula



and

(b) (N-n-butylthiazolium)$^+$(7,7,8,8-tetracyanoquinodimethane)$^-$(7,7,8,8-tetracyanoquinodimethane) expressed by the following formula



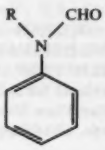
4,157,333

PROCESS FOR PREPARING PIPERONAL

Kiyoshi Nakatani, Tokyo; Tsuneo Inoue, Yokohama; Tutomu Nishizawa, Kamakura; Satoshi Numata, Yokohama, and Tsutomu Ishii, Kawasaki, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

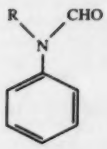
Filed Dec. 20, 1977, Ser. No. 862,392
Int. Cl.[2] C07D *317/44*
U.S. Cl. 260—340.5 R 17 Claims

1. A process for preparing piperonal which comprises the steps of reacting 1,2-methylenedioxybenzene with an N-alkylformanilide of the general formula



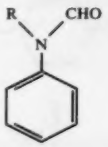
wherein R is an alkyl group having from 1 to 4 carbon atoms, and a condensing agent of at least one compound selected from the group consisting of phosgene, thionyl chloride, thionyl bromide, sulfuryl chloride, sulfuryl bromide, phosphorus trichloride, and phosphorus pentachloride, and then hydrolyzing the resulting reaction product to form piperonal.

8. A process for preparing piperonal which comprises the steps of reacting an N-alkylformanilide of the general formula



wherein R is an alkyl group having from 1 to 4 carbon atoms, with a condensing agent of at least one compound selected from the group consisting of phosgene, phosphorus oxychloride, phosphorus oxybromide, thionyl chloride, thionyl bromide, sulfuryl chloride, phosphorus trichloride, phosphorus pentachloride, and sulfuryl bromide, at a temperature in the range of −40° to 100° C. to form a reaction mixture containing an amide chloride, adding the reaction mixture to 1,2-methylenedioxybenzene to react said amide chloride with said 1,2-methylenedioxybenzene at a temperature in the range of 50° to 120° C., and then hydrolyzing the resulting reaction product to form piperonal.

15. A process for preparing piperonal which comprises the steps of reacting an N-alkylformanilide of the general formula



wherein R is an alkyl group having from 1 to 4 carbon atoms, with a condensing agent of at least one compound selected from the group consisting of phosgene, phosphorus oxychloride, phosphorus oxybromide, thionyl chloride, thionyl bromide, sulfuryl chloride, sulfuryl bromide, phosphorus trichloride and phosphorus pentachloride at a temperature in the range of −20° to 70° C. to form a reaction mixture containing an amide chloride, adding the reaction mixture to 1,2-methylenedioxybenzene, and reaction mixture being kept at a temperature of from −20° to 50° C. during the addition thereof, and said 1,2-methylenedioxybenzene being kept at a temperature of from 60° to 100° C. during the addition of said reaction mixture, heating the resulting mixture at a temperature of 60° to 100° C. to complete the reaction of said amide chloride with said 1,2-methylenedioxybenzene, and then hydrolyzing the resulting product to form piperonal.

4,157,334

6-CARBOXY-FLAVONE DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Gianfederico Doria; Piernicola Giraldi; Francesco Lauria; Maria L. Corno, all of Milan; Piero Sberze, Varese, and Marcello Tibolla, Canale d'Agordo, all of Italy, assignors to Carlo Erba S. p. A., Milan, Italy

Continuation-in-part of Ser. No. 660,383, Feb. 23, 1976, Pat. No. 4,065,467, which is a continuation of Ser. No. 536,476, Dec. 26, 1974, abandoned. This application Sep. 26, 1977, Ser. No. 836,498

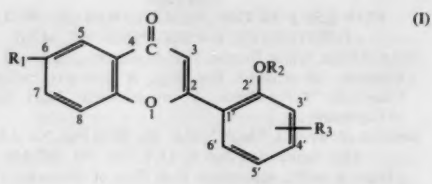
Claims priority, application Italy, Oct. 21, 1976, 28527 A/76

The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.

Int. Cl.[2] C07D *311/02;* **A61K** *31/35*

U.S. Cl. 260—345.2 **16 Claims**

1. A compound of the formula:



(I)

wherein

R_1 is

(a) carboxy or

(b) —$COOR_4$, wherein R_4 is C_1–C_{12} alkyl or C_3–C_4 alkenyl;

R_2 is

(a′) C_1–C_6 alkyl, which may be unsubstituted or substituted by C_1–C_2 alkoxy, or (b′) C_3–C_4 alkenyl;

R_3 is C_1–C_4 alkyl; and the salts thereof with pharmaceutically acceptable bases.

4,157,335

FAT RECOVERY SYSTEM

James C. Dobbs, Yakima, Wash., assignor to George H. Elliott Company, Chicago, Ill.

Division of Ser. No. 687,326, May 17, 1976, Pat. No. 4,087,251. This application Jul. 27, 1977, Ser. No. 819,470

Int. Cl.[2] C11B *1/12*

U.S. Cl. 260—412.6 **3 Claims**

1. A method of fat recovery for hide fleshings and trimmings comprising the steps of,

comminuting the fleshings and trimmings material to a size less than ½",

transferring the comminuted material by steam to a cooker to preheat and convey the same,

confining and cooking the thus comminuted fleshings and trimmings material while transporting the same by an auger in a cylindrical housing in constant agitation in a horizontal atmospherically vented pathway,

screening the residual particulate material after cooking while discharging the fat to a further confined means,

pressing the remaining particulate material in a zone in fluid communication with the discharged fat,

removing from the press the particulate material,

combining the fat collected from the press with the fat collected by the screening means and diverting the combined fats into a settling area,

heating the settling area after and during passing water into the same to a temperature between 180° F. and 200° F.,

and thereafter transferring the thus separated fat out of the settling area for further processing and removing the particulate material from the settling area for further processing.

4,157,336

CARBOXYLATE TRANSMETALLATION-ESTERIFICATION PROCESS

Robert K. Jordan, Carlton House, Suite 1431, 550 Grant St., Pittsburgh, Pa. 15219

Filed Jan. 10, 1977, Ser. No. 758,082

Int. Cl.[2] C07F *1/08, 3/08, 11/00, 15/02*

U.S. Cl. 260—429 R **12 Claims**

1. A process for the coproduction of metal carboxylates and esters of carbamic acids, and decomposition products thereof, comprising combining an ester of a carboxylic acid and a metal salt of a carbamic acid.

4,157,337

PROCESS FOR THE POLYMERIZATION OF CYCLIC DIORGANOPOLYSILOXANES WITH CATION-COMPLEX CATALYSTS

Edwin R. Evans, Clifton Park, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 574,333, May 5, 1975, abandoned. This application Jul. 6, 1977, Ser. No. 813,250

Int. Cl.[2] C07F *7/08*

U.S. Cl. 260—448.2 E 33 Claims

1. A process for producing a diorganopolysiloxane having a viscosity of from 50 to 200,000,000 centipoise at 25° C. comprising (A) reacting a composition comprising

(i) a cyclic polysiloxane of the formula,

$$(R\ R^1\ SiO)_x$$

or a mixed such polysiloxane wherein R is methyl, ethyl, vinyl or phenyl and R^1 is as defined for R and in addition, alkyl, halogenated alkyl, or cycloalkyl, each of 3 to 8 carbon atoms and x is from 3 to 6, and

(ii) a cyclic polysiloxane of the formula,

$$(R_2^2\ SiO)_y$$

wherein R^2 is, independently, methyl, ethyl, vinyl or phenyl and y is from 3 to 6, or a mixed such polysiloxane, (i) being present in an amount of from 30 to 100 mol % of the composition, at a temperature in the range of 20° to 160° C. in the presence of 5 to 500 parts per million, as KOH, of a catalyst comprising (a) KOH complexed with a molar equivalent of a cyclic polyether, or (b) a silanolate of KOH complexed with a molar equivalent of a cyclic polyether and (B) neutralizing the catalyst in the reaction mixture after equilibrium has been reached.

4,157,338

CONVERSION OF SYNTHESIS GAS TO HYDROCARBON MIXTURES

Werner O. Haag, Lawrenceville, and Tracy J. Huang, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 729,242, Oct. 4, 1976, abandoned, which is a continuation of Ser. No. 566,161, Apr. 8, 1975, abandoned. This application Mar. 6, 1978, Ser. No. 883,970

Int. Cl.[2] C07C *1/04*

U.S. Cl. 260—449 R 5 Claims

1. In a process for producing a hydrocarbon product effluent by contacting a syngas mixture of hydrogen and carbon monoxide with a catalyst mixture comprising a CO reducing component in combination with a special crystalline zeolite providing a silica to alumina ratio of at least 12 and a constraint index within the range of 1 to 12, the improvement which comprises,

converting syngas initially comprising hydrogen and CO in a ratio up to about 2 to 1 to primarily gasoline boiling range hydrocarbons with limited methane production by contacting a catalyst mixture comprising from about 0.2 up to about 5 weight percent of ruthenium in combination with said special crystalline zeolite, maintaining the temperature during contact within the range of about 470° F. to about 650° F. and a pressure within the range of 400 to 1500 psig, selecting a temperature in the range of about 530° to about 650° F. for aromatic gasoline production and in the range of about 470° to about 530° F. for predominantly olefinic gasoline production, separating light gases containing excess carbon monoxide from the reactor product effluent and providing a portion of the separated gases for admixture with fresh syngas feed as required and passed to the syngas conversion step.

4,157,339

PHOSPHONAMIDIC CONDENSATION REACTION PRODUCT

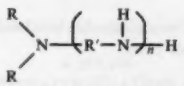
Thomas J. Clough, Flossmoor, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Continuation of Ser. No. 172,207, Aug. 16, 1971, abandoned, which is a division of Ser. No. 169,527, Aug. 5, 1971, Pat. No. 3,733,363, which is a division of Ser. No. 629,929, Apr. 11, 1967, Pat. No. 3,650,953. This application Jun. 16, 1977, Ser. No. 807,103

Int. Cl.[2] C07F *9/22, 9/26, 9/36*

U.S. Cl. 260—551 P 9 Claims

1. A mineral oil-soluble phosphonamidic condensation reaction product of (A) a lubricating-oil soluble phosphorylated polymer having a kinematic viscosity at 210° F. of up to about 5,000 centistokes, said polymer being prepared by the polymerization of from about 55–100 mole percent of an α-monoalkene having from 3 to about 30 carbon atoms and up to about 49 mole percent of a dissimilar olefinically unsaturated copolymerizable monomer having from 3 to about 20 carbon atoms in the presence of a polymerization catalyzing amount of a catalyst solution comprising strong Friedel-Crafts catalyst and, a monochloroalkane solvent of 1 to 4 carbon atoms and a complex of a phosphorus halide and a Friedel-Crafts catalyst, and (b) a polyamine having the formula



wherein R′ is a divalent alkylene radical of 2 to about 14 carbon atoms, R is hydrogen or a hydrocarbon radical of 1 to about 30 carbon atoms and n is 1 to about 10, the amounts of (A) and (B) in said product being sufficient to provide from at least about 0.1 gram atom of hydrogen-bonded nitrogen, to about 2 moles of (B) per gram atom of phosphorus in (A), said condensation reaction product being soluble in a lubricating oil said polymerization and said reaction being conducted at a temperature, pressure and time sufficient to form said polymer and said reaction product.

4,157,340

N,N′-[BIS(N-CYANOGUANYL)]CYSTAMINE DERIVATIVES

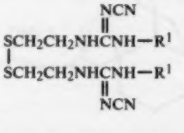
Ronnie R. Crenshaw, Dewitt, N.Y.; Gerry Kavadias, St. Lambert, and Roger F. Saintonge, Montreal, both of Canada, assignors to Bristol-Meyers Company, New York, N.Y.

Filed Jun. 27, 1978, Ser. No. 919,597

Int. Cl.[2] C07C *125/08*

U.S. Cl. 260—551 C 10 Claims

1. A compound of the formula



in which each R^1 is the same and is a straight or branched chain alkynyl group containing from 3 to 9 carbon atoms, or an acid addition salt thereof.

4,157,341

11-DESOXY-16-ARYLOXY-ω-TETRANORPROSTAGLANDINS

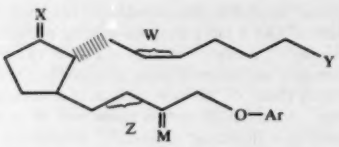
Jasjit S. Bindra, Groton; James F. Eggler, Stonington; Michael R. Johnson, Gales Ferry, and Thomas K. Schaaf, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 589,386, Jun. 23, 1975. This application Nov. 9, 1977, Ser. No. 849,752

Int. Cl.[2] C07C *177/00*

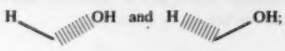
U.S. Cl. 260—559 B **15 Claims**

1. Optically active compounds of the formula



their optical antipodes and the racemates thereof

wherein X and M are selected from the group consisting of keto,



W is a single bond or a cis double bond and Z is a single bond or a trans double bond;

Y is

wherein R″ is selected from the group consisting of alkanoyl of from two to five carbon atoms, cycloalkanoyl of from four to seven carbon atoms, benzoyl, monosubstituted benzoyl, alkylsulfonyl of from one to four carbon atoms, phenylsulfonyl and monosubstituted phenylsulfonyl wherein the phenyl and benzoyl substituent is selected from the group consisting of fluoro, chloro, bromo, trifluoromethyl, lower alkyl, lower alkoxy and phenyl; and Ar is selected from the group consisting of phenyl, α-naphthyl, β-naphthyl and monosubstituted phenyl wherein the substituent is selected from the group consisting of fluoro, chloro, bromo, lower alkyl, lower alkoxy, phenyl and trifluoromethyl.

4,157,342

PROCESS FOR PREPARATION OF 3-ACYLAMINO-4-HOMOISOTWISTANE

Yoshiaki Inamoto, and Koji Aigami, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

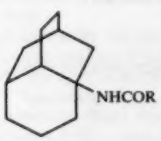
Filed Jun. 22, 1978, Ser. No. 917,965

Claims priority, application Japan, Jul. 6, 1977, 52-81448

Int. Cl.[2] C07C *103/37*

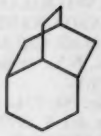
U.S. Cl. 260—561 R **4 Claims**

1. A process for the preparation of 3-acylamino-4-homoisotwistane having the formula (I):



(I)

wherein R is alkyl having 1 to 3 carbon atoms, which consists essentially of reacting 4-homoisotwistane having the formula (II):



(II)

with a nitrile having the formula (III):

RCN (III)

wherein R is the same as defined above, in the presence of bromine and liquid phase water and in the absence of sulfuric acid, until the formula (I) compound is formed and then recovering the formula (I) compound from the reaction mixture.

4,157,343

PREPARATION OF AROMATIC DIAMINES

James P. Shoffner, Elk Grove Village, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 804,135, Jun. 6, 1977, abandoned. This application Jun. 22, 1978, Ser. No. 918,207

Int. Cl.[2] C07C *85/18*

U.S. Cl. 260—570.9 **12 Claims**

1. A process for the preparation of an aromatic diamine which comprises reacting a primary or secondary formimine, which is prepared by reacting a linear or branched chain primary alkyl amine with a formaldehyde to form said formimine reactant characterized by possession of a linear or branched chain alkyl moiety attached to the nitrogen atom of said formimine reactant, with a tertiary aromatic amine in an anhydrous acidic medium, and recovering the resultant aromatic diamine.

4,157,344

PREPARATION OF ARYL TRIFLUOROMETHYL ETHERS

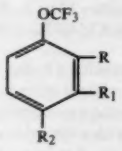
Andrew E. Feiring, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 16, 1978, Ser. No. 870,022

Int. Cl.[2] C07C *85/00, 41/00*

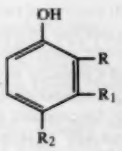
U.S. Cl. 260—575 **3 Claims**

1. The process of preparing an aryl trifluoromethyl ether of the general formula:



comprising reacting in the temperature range of about 80° to about 175° C. and under sufficient pressure to keep most of the hydrogen fluoride in the liquid state the following:

(a) a phenolic compound of the formula



wherein, independently,

R is H, Cl, F or Br;

R_1 is H, Cl, Br, F, NO_2, NH_2, CN, CF_3, alkyl containing 1–4 carbon atoms, phenyl or benzoyl; and

R_2 is H, Cl, Br, F, NO_2, NH_2, CN, CF_3, alkyl containing 1–4 carbon atoms, phenyl, benzoyl or OH; and

(b) at least an equimolar amount of a perhalomethane selected from the group consisting of CCl_4, $CFCl_3$ or $CBrCl_3$; and

(c) at least three molar equivalents of substantially anhydrous hydrogen fluoride.

4,157,345

2,6,6-TRIMETHYL-3-ALKOXY-CYCLOHEX-2-EN-1-ONES

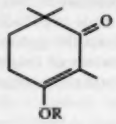
Michael Rosenberger, Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 723,411, Sep. 15, 1976, Pat. No. 4,045,476, which is a division of Ser. No. 585,224, Jun. 9, 1975, Pat. No. 4,000,198. This application Jun. 2, 1977, Ser. No. 802,752

Int. Cl.[2] C07C *49/48*

U.S. Cl. 260—586 R **2 Claims**

1. A compound of the formula:



wherein R is an alkyl group containing from 3 to 8 carbon atoms.

4,157,346

CATALYTIC EPOXIDATION OF ALKYLENE COMPOUNDS

Ellwood L. Lines, New Haven; Robert J. Fairbrother, Cheshire, and John A. Herbst, Madison, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 734,588, Oct. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,214, Jun. 27, 1975, abandoned. This application Mar. 30, 1978, Ser. No. 891,869

Int. Cl.[2] C07D *301/12*

U.S. Cl. 260—348.31 **10 Claims**

1. A method for preparing an alkylene oxide which comprises reacting an alkylene compound with hydrogen peroxide in the presence of a molybdenum compound catalyst at a reaction temperature ranging from about 20° C. to about 60° C., wherein said catalyst is a preformulated compound prepared by reacting together, at a temperature of about 70°–160° C., (a) an oxygen-containing molybdenum compound selected from the group consisting of molybdenum dioxide, molybdenum sesquioxide, molybdenum trioxide, mixtures of said oxides, and the ammonium salt of molybdic acid, and, per every mole of molybdenum, (b) about 1.5–20 moles of an alkylene glycol having 2–10 carbon atoms and (c) about 0.1–4 moles of an amine or N-oxide thereof, said amine being represented by the formula $R_1R_2R_3N$ in which each of R_1, R_2, and R_3 is independently hydrogen or alkyl of 1–10 carbon atoms with the proviso that at least one of R_1, R_2 and R_3 is not hydrogen.

4,157,347

N-CYANO ISOTHIOUREAS

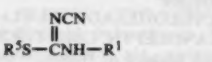
Ronnie R. Crenshaw, Dewitt, and George M. Luke, LaFayette, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 848,959, Nov. 7, 1977, Pat. No. 4,112,234, which is a continuation-in-part of Ser. No. 826,796, Aug. 22, 1977, abandoned, which is a continuation-in-part of Ser. No. 803,009, Jun. 3, 1977, abandoned. This application Aug. 24, 1978, Ser. No. 936,668

Int. Cl.[2] C07C *125/08*

U.S. Cl. 260—551 C **10 Claims**

1. A compound of the formula



wherein R^1 is a straight or branched chain alkynyl group containing from 3 to 9 carbon atoms, inclusive, and R^5 is (lower)alkyl, phenylalkyl or phenyl containing 1 or 2 substituents independently selected from nitro, chloro and bromo, or an acid addition salt thereof.

4,157,348

PROCESS FOR PREPARING GUANIDINE

Hiroshi Ono, Fujisawa, and Shigeru Inoue, Kamakura, both of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Mar. 21, 1978, Ser. No. 888,613

Claims priority, application Japan, Apr. 5, 1977, 52/38093

Int. Cl.[2] C07C *129/00*

U.S. Cl. 260—564 D **19 Claims**

1. A process for preparing guanidine, comprising separating guanidine from a process stream derived from a urea production process in which ammonia and carbon dioxide are reacted under high temperature and high pressure conditions to give urea, said guanidine being a by-product produced in the urea synthesis.

4,157,349

DEHYDROHALOGENATION PROCESS

Malcolm R. Bell, East Greenbush; John L. Herrmann, Jr., Kinderhook, and Vahan Akullian, Menands, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,776

Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—586 F **7 Claims**

1. A process for preparing 5-ethenyl-2(3H)-4a-methyl-4,4a,7,8-tetrahydronaphthalen-2-one which comprises heating 5-(2-bromoethylidene)-2(3H)-4a-methyl-4,4a,5,6,7,8-hexahydronaphthalen-2-one in an inert solvent at a temperatu re between 75° and 150° C.

2. A process for preparing 5-ethenyl-2(3H)-4a-methyl-4,4a,7,8-tetrahydronaphthalen-2-one which comprises treating 5-(2-bromoethylidene)-2(3H)-4a-methyl-4,4a,5,6,7,8-hexahydronaphthalen-2-one in an inert solvent with at least one dehydrohalogenating agent selected from the group consisting of pyridine, a lower-alkylated pyridine, an alkali metal phenoxide, a lower-alkylated alkali metal phenoxide, lithium chloride, lithium bromide and lithium carbonate.

4,157,350

PROCESS FOR PREPARING 1-(2,6,6-TRIMETHYL-1,3-CYCLOHEXADIEN-1-YL)-1,3-BUTANEDIONE AND INTERMEDIATES

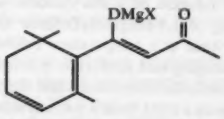
Richard A. Wilson, Westfield; Braja D. Mookherjee, Holmdel, and William I. Taylor, Summit, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 17, 1978, Ser. No. 887,628

Int. Cl.[2] C07C *49/61*

U.S. Cl. 260—586 R **2 Claims**

1. An organometallic compound having the structure:



wherein X is selected from the group consisting of chloro, bromo and iodo.

4,157,351

1-(2,6,6-TRIMETHYL-1,3-CYCLOHEXADIEN-1-YL)-1,3-BUTANEDIONE AND ORGANOLEPTIC USES THEREOF

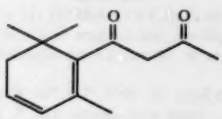
Braja D. Mookherjee, Holmdel; Richard A. Wilson, Westfield; Frederick L. Schmitt, Holmdel; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 17, 1978, Ser. No. 887,630

Int. Cl.[2] C07C *49/61*

U.S. Cl. 260—586 R 2 Claims

1. Substantially pure 1-(2,6,6-Trimethyl-1,3-cyclohexadien-1-yl)-1,3-butanedione, having the structure:



4,157,352

PROCESS FOR THE MANUFACTURE OF A CYCLOPENTENEDIONE

Wolf Brenner, Füllinsdorf, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 19, 1978, Ser. No. 926,593

Claims priority, application Switzerland, Aug. 12, 1977, 9910/77

Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—586 P 17 Claims

1. A process for the manufacture of 2,2,4-trimethyl-cyclopent-4-ene-1,3-dione, which comprises oxidizing 3,5,5-trimethyl-cyclohex-2-ene-1,4-dione with oxygen or an oxygen-containing gas in the presence of a catalyst selected from the group consisting of manganese, cobalt or copper containing compounds.

4,157,353

PROCESS FOR RECOVERING A DIALKYLARYLKETONE

Anatoli Onopchenko, Monroeville, and Johann G. Schulz, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 782,630, Mar. 30, 1977, Pat. No. 4,093,660. This application Jan. 23, 1978, Ser. No. 871,239

Int. Cl.[2] C07C *49/76*

U.S. Cl. 260—591 23 Claims

1. A process for recovering a dialkylarylketone selected from the group consisting of 3,4,3',4'-tetramethylbenzophenone and 4,4'-dimethylbenzophenone from an oily mixture contaminated largely with the corresponding 1,1-diaryl-2-nitroethylene, said oily mixture having been obtained as a result of the nitric acid oxidation of a diarylalkane selected from the group consisting of 1,1-bis(p-tolyl)ethane and 1,1-bis(3,4-dimethylphenyl) ethane at a temperature below about 140° C. which comprises heating said mixture to a temperature of at least about 140° until solidification occurs and then recovering the dialkylarylketone as a solid from a solvent solution of the 1,1-diaryl-2-nitroethylene, said solvent being selected from the group consisting of ketones, organic acids and chlorinated hydrocarbons.

4,157,354

CYCLOPARAFFIN DEHYDROGENATION TO FORM AROMATICS USING PALLADIUM ALLOY FOIL

Viktor S. Smirnov, Kutuzovsky prospekt, 26, kv. 555; Vladimir M. Gryaznov, Leninskie Gory, MGU, Zona L, kv. 11; Valentina I. Lebedeva, Leninsky prospekt, 48a, kv. 29; Alexandr P. Mischenko, Khersonskaya ulitsa, 7, korpus 4, kv. 115; Victoria P. Polyakova, ulitsa Trofimova, 15, kv. 201, and Evgeny M. Savitsky, ulitsa Dm. Ulyanova, DNR-3, kv. 13, all of Moscow, U.S.S.R.

Division of Ser. No. 578,659, May 19, 1975, Pat. No. 4,041,093, which is a continuation of Ser. No. 434,224, Jan. 17, 1974, abandoned, Division of Ser. No. 271,186, Jul. 12, 1974, Pat. No. 3,865,891, which is a division of Ser. No. 23,037, Mar. 26, 1970, abandoned. This application Dec. 30, 1976, Ser. No. 755,597

Int. Cl.[2] C07C *15/00*

U.S. Cl. 585—434 2 Claims

1. A method for the selective preparation of aromatic hydrocarbons by the dehydrogenation of cycloparaffins, which comprises the passing of a vaporized cycloparaffin hydrocarbon feedstock at a temperature of 300° to 650° C. over a catalyst in the form of a foil made of palladium alloyed with at least one member selected from the group consisting of rhenium, tungsten, and a combination of tungsten and ruthenium, the content of palladium in said alloy ranging from 60 to 99 weight percent.

4,157,355

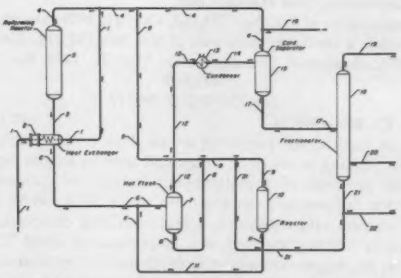
COMBINATION PROCESS FOR SELECTED AROMATIC HYDROCARBON PRODUCTION

George E. Addison, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 13, 1978, Ser. No. 886,315

Int. Cl.[2] C07C *3/58*

U.S. Cl. 585—321 10 Claims



1. A combination process for the production of a selected aromatic hydrocarbon concentrate which comprises the sequential steps of:

(a) reacting a hydrocarbonaceous charge stock and hydrogen in a catalytic reforming first reaction zone, at reforming conditions selected to convert paraffins and naphthenes to aromatic hydrocarbons;

(b) separating the resulting first reaction zone effluent, in a first separation zone, at a temperature of at least 250° F. but not substantially exceeding about 400° F. and a reduced pressure to provide (i) a first vaporous phase containing said selected aromatic hydrocarbon concentrate and, (ii) a first liquid phase containing higher boiling, alkylaromatic hydrocarbons;

(c) reacting said first liquid phase in a dealkylation second reaction zone, at dealkylation conditions selected to dealkylate said alkylaromatic hydrocarbons;

(d) introducing the resulting second reaction zone effluent into said first separation zone;

(e) separating said first vaporous phase, in a second separation zone, at substantially the same pressure and a lower temperature in the range of about 60° F. to about 140° F., to provide (i) a hydrogen-rich second vaporous phase and,

(ii) a second liquid phase containing substantially all of said aromatic concentrate;

(f) recycling at least a portion of said hydrogen-rich second vaporous phase to said first reaction zone; and,

(g) separating said second liquid phase, in a third separation zone, (i) to recover said selected aromatic concentrate and, (ii) to provide a concentrated stream of higher boiling aromatic hydrocarbons.

4,157,356

PROCESS FOR AROMATIZING C_3–C_8 HYDROCARBON FEEDSTOCKS USING A GALLIUM CONTAINING CATALYST SUPPORTED ON CERTAIN SILICAS

Stanley N. Bulford, Shepperton, and Evan E. Davies, Woking, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Dec. 2, 1977, Ser. No. 856,667

Claims priority, application United Kingdom, Dec. 20, 1976, 53011/76

Int. Cl.[2] **C07C** *15/02;* **B01J** *23/08*

U.S. Cl. 585—415 **16 Claims**

1. A process for producing aromatic hydrocarbons comprising contacting at an elevated temperature a C_3–C_8 hydrocarbon feedstock with a catalyst composition consisting essentially of gallium on a silica support wherein the silica has a surface area greater than 500 m^2/g and a pore volume of less than 0.8 ml/g.

4,157,357

CURABLE TWO-PART SILICONE RUBBER COMPOSITIONS WITH IMPROVED ADHESION PROPERTIES

Katsutoshi Mine, and Masuo Yokoyama, both of Ichihara, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Mar. 14, 1977, Ser. No. 777,221

Claims priority, application Japan, Jun. 2, 1976, 51/63553

Int. Cl.[2] **C08L** *83/04, 83/14*

U.S. Cl. 260—825 **7 Claims**

1. A curable composition of matter which consists essentially of a mixture of

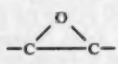
(a) an organopolysiloxane containing at least two hydrogen atoms bonded to silicon atoms and having the general formula

$$R_aSiO_{4-a/2}$$

wherein a has an average value of 1-3 and R is hydrogen, hydroxy radicals or unsubstituted or substituted monovalent hydrocarbon radicals which do not contain aliphatic unsaturation,

(b) an organopolysiloxane containing at least one $A(R'O)_2Si$- group and at least two lower alkenyl radicals bonded to silicon atoms, in each molecule, wherein

A is a monovalent hydrocarbon radical containing a



radical,

R′ is a lower alkyl radical containing 1–6 carbon atoms,

the sum of the number of hydrogen atoms bonded to silicon atoms in component (a) and the number of lower alkenyl radicals bonded to silicon atoms in component (b) is five or greater wherein there is present 0.1–10 mols of lower alkenyl groups bonded to silicon in (b) for every mol of hydrogen atoms bonded to silicon atoms in (a), and

(c) 0.1–40 parts by weight per one million parts by weight of components (a) and (b) of an addition reaction catalyst for the addition reaction of the hydrogen atoms bonded to silicon atoms with the lower alkenyl groups bonded to silicon atoms.

4,157,358

FLUORINATED NETWORK POLYMERS

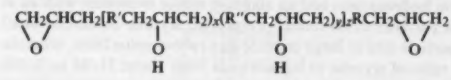
Donald E. Field, Falls Church, Va., and James R. Griffith, Riverdale Heights, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 736,965, Oct. 29, 1976, Pat. No. 4,132,681. This application Oct. 13, 1978, Ser. No. 950,945

Int. Cl.[2] **C08G** *18/28;* **C08L** *63/00, 75/08*

U.S. Cl. 260—836 **2 Claims**

1. An urethane resin prepared from a polymer of the general formula:



wherein x is an integer from 1 to 4, y is an integer from 1 to 4, z is greater than 10, R′ is selected from the group consisting of the 1,3 and 1,4 isomers of $—OC(CF_3)_2\phi C(CF_3)_2O—$, R″ is selected from the group consisting of the cis and trans isomers of $—O(CF_3)_2CCH_2CH{=}CHC(CF_3)_2O—$ and R is either R′ or R″.

4,157,359

POLYURETHANES STABILIZED AGAINST ULTRAVIOLET LIGHT AND NITROGEN OXIDE DETERIORATION

Eugene Y. C. Chang, and Samuel Kaizerman, both of Somerville, N.J., assignors to American Cyanamid Co., Stamford, Conn.

Continuation of Ser. No. 567,568, Apr. 14, 1975, abandoned, which is a continuation of Ser. No. 371,815, Jun. 20, 1973, abandoned. This application May 26, 1976, Ser. No. 690,127

Int. Cl.[2] **C08L** *61/20*

U.S. Cl. 260—849 **12 Claims**

1. A composition stabilized against the deteriorative effects of ultraviolet light and nitrogen oxides which comprises a polyurethane containing a stabilizing amount of a composition comprising (1) an aminoplast resin, (2) an ultraviolet light absorber comprising a 2-hydroxybenzophenone, a benzotriazole or a benzylidene-malonic ester and (3) a phenolic antioxidant, said polyurethane being the reaction product of a polyurethane prepolymer prepared by reacting a polyether, a polyester of a polyformal polyol with an aromatic diisocyanate and reacting the isocyanate terminated prepolymer thus formed with a low molecular weight compound containing two active hydrogen atoms which display activity according to the Zerewitinoff test.

4,157,360

THERMOFORMABLE COMPOSITIONS COMPRISING A CROSSLINKED POLYCYANURATE POLYMER AND A THERMOPLASTIC POLYMER

Dusan C. Prevorsek, Morristown, and Daniel C. Chung, Edison, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Apr. 26, 1978, Ser. No. 900,226

Int. Cl.[2] **C08L** *69/00;* **C08G** *63/64*

U.S. Cl. 260—860 **25 Claims**

1. A cured composition consisting essentially of a crosslinked cyanurate polymer and a thermoplastic polymer of at least film-forming molecular weight, wherein the composition possesses:

(a) a Vicat softening temperature of at least about 10° C. above that of said linear polymer alone, as determined by ASTM 1525; and,

(b) an elongation-at-break value which is at least twice as great as that of said crosslinked polymer alone, as determined by ASTM D-638, at room temperature.

4,157,361

ABS COMPOSITION HAVING IMPROVED IMPACT STRENGTH AND WEATHER AGING RESISTANCE AND LATEX SUSPENSION PROCESS THEREFOR

Robert J. Cornell, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 560,783, Mar. 21, 1975, Pat. No. 4,107,234. This application Apr. 17, 1978, Ser. No. 897,090

Int. Cl.[2] C08L 9/02, 9/06

U.S. Cl. 260—876 R 14 Claims

1. A method of making a polyblend, said method comprising suspension polymerizing 55 to 95% of a monovinylidene aromatic hydrocarbon and an alkenoic nitrile monomer with an at least partially cross-linked pre-grafted styrene-butadiene small or particle size or large particle size rubber spine latex, wherein the ratio of styrene to butadiene is from about 31/69 to 0/100 and said rubber spine is pre-grafted with a monovinylidene aromatic hydrocarbon or alkenoic nitrile monomer or mixtures thereof, and 0.25 to 22.5% of a low-gel elastomer selected from the group consisting of styrene-butadiene rubbers wherein the ratio of styrene to butadiene is from about 31/69 to 0/100 and acrylonitrile-butadiene rubbers wherein the ratio of acrylonitrile to butadiene is from about 15/85 to 50/50 in a suspending solution in an oxygen free atmosphere at a temperature of about 105°–250° F. in the presence of a catalytically effective amount of at least one polymerization initiator selected from the group consisting of peroxide initiators and azo initiators, at least one chain transfer agent, an antioxidant and a gelling agent to form a substantially completely polymerized product in the form of beads.

4,157,362

PROCESS FOR CARBOXYLATION OF ETHYLENE-VINYL ACETATE COPOLYMERS

Nobuo Morishita, and Mitsutaka Saito, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Mar. 16, 1978, Ser. No. 887,218

Claims priority, application Japan, May 16, 1977, 52-55296

Int. Cl.[2] C08F 263/04

U.S. Cl. 260—878 R 12 Claims

1. A process for the carboxylation of ethylene-vinyl acetate copolymers, which comprises:

copolymerizing an α, β-unsaturated carboxylic acid, an anhydride thereof or a mixture thereof with an ethylene-vinyl acetate copolymer in the presence of a polymerization initiator in a reaction medium of a ketone compound or a mixture of an acetic acid ester and a ketone compound, and optionally

in the presence of at least one vinylidene monomer having the formula:

wherein X and Y can be the same or different and each represents hydrogen, chlorine, alkyl, acetoxy, carboxylic acid ester group or cyano;

wherein the reaction is conducted in a heterogeneous state so as not to alter the physical form of said ethylene-vinyl acetate copolymer.

4,157,363

RUBBER COMPOSITION

Paul Hepworth, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 2, 1976, Ser. No. 710,881

Claims priority, application United Kingdom, Aug. 20, 1975, 34592/75; Apr. 20, 1976, 15882/76

Int. Cl.[2] C08L 7/00; C09L 23/18

U.S. Cl. 260—889 10 Claims

1. A composition comprising a rubber and a resin

wherein the resin has been produced by the copolymerization of a C_5 hydrocarbon stream and a butene,

wherein said C_5 hydrocarbon stream contains dicyclopentadiene or a codimer of cyclopentadiene with a diene selected from the group consisting of butadiene, isoprene and piperylene, wherein the amount of said dicyclopentadiene or said codimer is at least 10% by weight of the total weight of said C_5 hydrocarbon stream and said butene;

wherein said C_5 hydrocarbon stream contains not more than 10% by weight of 2-methylbutene-2; and

wherein said resin has a molecular weight of 500 to 40,000 and contains 10% to 90% by weight butene.

4,157,364

PROCESS FOR PREPARING DIMETHYLAMINOMETHYLENEBIS(PHOSPHONIC ACID)

John D. Buckman; Gerald D. Mercer, and John D. Pera, all of Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Division of Ser. No. 845,011, Oct. 25, 1977. This application Feb. 8, 1978, Ser. No. 875,964

Int. Cl.[2] C07F 9/40

U.S. Cl. 260—976 6 Claims

1. A process for preparing dimethylaminomethylenebis (phosphonic acid) and a chloroalkane or dichloroalkane wherein dimethylformamide is reacted with phosphorous trichloride in the presence of a chloroalkane or a dichloralkane as a solvent at a temperature below about 45° C., and the reaction mixture is subsequently reacted with an alcohol or a glycol wherein said alcohol or glycol is added at such a rate that the temperature does not exceed about 45° C. and then adding water to the system and heating said system to a temperature corresponding to about the boiling point of the water in said system and subsequently recovering said dimethylaminoethylenebis (phosphonic acid) and said chloroalkane or dichloroalkane characterized in that the chloroalkane has the formula RCl and the dichloroalkane has the formula Cl—R′—Cl or $ClCH_2CH_2(OCH_2CH_2)_nCl$, the glycol has the formula HO—R′—OH or $HOCH_2CH_2(OCH_2CH_2)_nOH$, the alcohol has the formula ROH wherein R is a straight or branched chain alkyl group containing 1 to 20 carbon atoms, R′ is a methylene group containing 2 to 10 carbon atoms and n is 1 to 5.

4,157,365

ACCELERATION PUMP OF CARBURETOR

Tadashi Inoue, Katsuta; Tohru Nakagawa, Mito, and Mineo Kashiwaya, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 13, 1977, Ser. No. 841,736

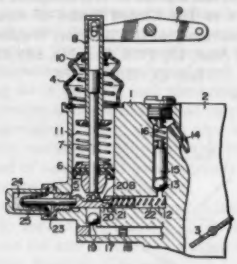
Claims priority, application Japan, Oct. 15, 1976, 51-122838

Int. Cl.[2] F02M 7/08

U.S. Cl. 261—34 B 4 Claims

1. An acceleration pump of a carburetor having a cylinder disposed in a fuel passage way connecting a float chamber and a carburetor barrel, and a piston housed by said cylinder and adapted to be actuated at the time of acceleration to discharge the fuel in said cylinder into said carburetor barrel, characterized by a stopper member being positioned below said piston in said cylinder so as to be movable in a direction which is at a right angle to the direction of stroking of said piston, said stopper member being operably connected to an incompressi-

ble temperature detecting element for variably limiting the stroke of said piston, and wherein a part of said stopper mem-



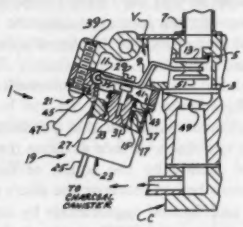
ber is received within said fuel passage way, said part being provided with a throughpassage for communicating fuel in said cylinder with said fuel passage way.

4,157,366

APPARATUS FOR VENTING FUEL VAPORS

Harvey L. Ruth, Maryland Heights, and Larry J. Tipton, Florissant, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,240
Int. Cl.[2] F02M 5/08
U.S. Cl. 261—72 R **10 Claims**



1. Apparatus for venting fuel vapors present in the fuel bowl of a carburetor for an internal combustion engine comprising:

a bowl vent through which fuel vapors discharge when the vent is open;

a valve for opening and closing the vent;

means for exerting a biasing force on the valve to close the vent; and

first and second means responsive to the starting of said engine for exerting an opening force on the valve sufficient to overcome the biasng force exerted thereon and open the vent, each of said first and second means being independently capable of exerting sufficient opening force on the valve to open the vent whereby the vent is open when the engine is running even if one of said first and second means fails to operate or is incapable of exerting sufficient opening force on the valve.

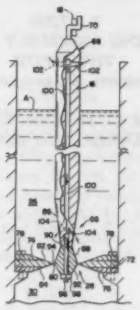
4,157,367

ATOMIZING DEVICE FOR CARBURETORS

Gyula S. Fuchs, Cleveland, Ohio, assignor to Lou Nagy, Fairview Park, Ohio

Filed Feb. 3, 1978, Ser. No. 874,882
Int. Cl.[2] F02M 7/02
U.S. Cl. 261—121 A **11 Claims**

1. In a carburetor for an internal combustion engine having an air bore opening to the manifold of said engine and subject to suction when said engine is operating, a fuel well and a passage connecting said well to said air bore, a fuel supply reservoir above said well, a metering orifice communicating said reservoir and well, a vertically displaceable metering rod coaxial with said orifice and having an axially extending tip and portion including means coacting with said orifice to vary the flow of fuel therethrough, means to displace said metering rod relative to said orifice in response to operation of said internal combustion engine, and air passageway means in said metering rod for directing air from an inlet above the level of



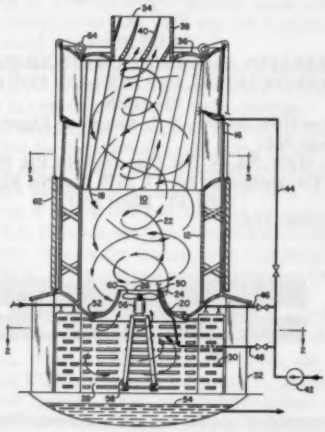
fuel in said reservoir to an outlet in said tip end portion, the improvement comprising: said orifice having upstream and downstream sides with respect to the direction of flow of fuel from said reservoir to said well, and said air passageway outlet in said tip end portion of said metering rod opening laterally from said rod into said reservoir on the upstream side of said orifice.

4,157,368

VORTEX COOLING TOWER

John H. Fernandes, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 23, 1977, Ser. No. 863,755
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—155 **40 Claims**



1. An air-cooled tower for cooling a fluid comprising: an upstanding cylindrical spin chamber having downwardly tangentially directed openings in the upper portion thereof, said openings having direct communication between said chamber and the surrounding atmosphere, and being sufficiently numerous to pass a large portion of the wind impacting on said chamber, an axially located outlet at the top, and an axially located inlet at the bottom; means for conducting ambient air to said axially located inlet whereby an induced air flow path is estab-

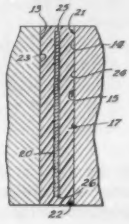
lished serially through said means for conducting ambient air, said inlet, and said chamber and an induced flow of air is established therethrough when wind driven air passes thru said tangentially directed openings; and heat exchange means for transferring heat between the fluid to be cooled and air passing through said upstanding chamber.

4,157,369

NOVEL SEALING ASSEMBLY AND METHOD THEREFOR

William D. Doyle, Elmhurst, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Filed Jun. 17, 1977, Ser. No. 807,584
Int. Cl.[2] B29C 5/00; B29G 7/00
U.S. Cl. 264—240 **10 Claims**



1. The method of curing moisture curable, organic polymer material in a cavity preventing adequate access to ambient moisture, comprising:

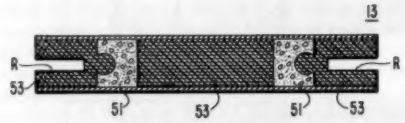
filling a cavity with said polymer material; wetting an absorbent, elongate, stiff member with water; substantially completely submerging said elongate, stiff, wetted member within said polymer material to provide moisture for curing said material; and thereafter causing said material to cure.

4,157,370

APPARATUS AND METHOD FOR COMPACTING MULTI-SECTIONAL PARTICULATE CONTAINING FILTERS

Floyd Van Hall, Durham, N.C., assignor to Liggett Group Inc., Durham, N.C.

Division of Ser. No. 887,564, Mar. 16, 1978, Pat. No. 4,116,602. This application Jul. 17, 1978, Ser. No. 925,343
Int. Cl.[2] B28D 1/48
U.S. Cl. 264—113 **2 Claims**



1. A method of compacting multi-sectional filter assemblies containing a pair of spaced particulate adsorption-type filter sections and alternate sections of entrainment-type filter material, said method comprising the step of

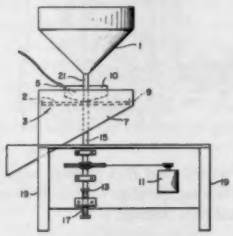
moving a punch into each of the opposite ends of a filter assembly to force a portion of the entrainment-type filter material at each end of the assembly into an adjacent interior particulate filter section to displace and compact the particulate filter material in said filter section while forming a recess in each of the opposite ends of the filter assembly.

4,157,371

METHOD OF AGGLOMERATING FINE POWDERS

Danton L. Paulson, and Robert B. Worthington, both of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 19, 1975, Ser. No. 559,936
Int. Cl.[2] B01J 2/14
U.S. Cl. 264—114 **6 Claims**



1. A method of agglomerating processed by product dust particles having a diameter of no more than 0.01 of an inch on a smooth circular horizontal disc with a raised outer edge extending totally around the disc comprising the steps of:

(a) depositing said particles at an area on the disc's surface which is offset no more than 15 percent of the circular disc's diameter away from the disc's center, said area having adjacent thereto guiding means to guide said deposited particles so that the vertical cross section of said particles at equilibrium forms a volumetric configuration resembling an upwardly opening hyperbolic surface centered near said area;

(b) rotating said disc at a substantially constant edge speed as said depositing step takes place;

(c) spraying a liquid binder on said particles as they are deposited on said disc's surface to cause them to become agglomerated mainly by the action of centrifugal and tangential forces before reaching the disc's edge; and

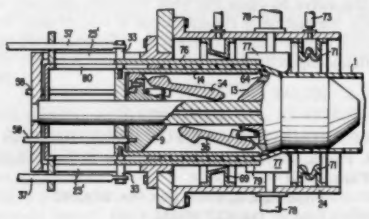
(d) conveying said formed agglomerate by centrifugal and tangential forces to move it over said raised outer edge to thereby discharge said agglomerate therefrom.

4,157,372

METHOD OF MOLDING A CONNECTING SOCKET PART ON A SYNTHETIC RESINOUS PIPE END

Junsuke Kyomen, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Aug. 19, 1976, Ser. No. 715,655
Claims priority, application Japan, Aug. 19, 1975, 50-101057
Int. Cl.[2] B29D 23/00
U.S. Cl. 264—296 **4 Claims**



1. A method of integrally molding a pipe connecting socket on a pipe end wherein a thermoplastic synthetic resinous pipe is temporarily heated to be softened and is molded while being enlarged in a bell-shape for the purpose of being connected

with the end of another pipe by the application of a metallic core mold, which comprises:

disposing at least the heat-softened end of said synthetic resinous pipe over a sleeve which sheathes a forming core;

augmenting the wall thickness of said synthetic resinous pipe by surrounding the exterior surface of said pipe with an external diameter-regulating barrel such that a space corresponding to a desired wall thickness of said pipe is formed between said sleeve and said barrel, and longitudinally compressing the end of said pipe by operation of a compression annulus slidably movable in said space such that the end of said pipe is longitudinally compressed and thereby completely fills said space;

radially outwardly swelling a portion of said heated resinous pipe end to form a ring groove for receiving a resilient packing near the end of said bell-shaped socket portion of said synthetic resinous pipe; and

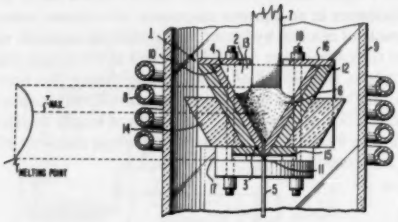
simultaneously with said step of swelling radially outwardly swelling another portion of said heated resinous pipe longitudinally inwardly disposed of said ring groove for providing a radially outwardly bulged space inward of said ring groove, said space permitting said another pipe inserted therein to be able to pivot eccentrically through a slight degree under external pressure;

wherein said simultaneous radially outwardly swelling of said portions of said heated resinous pipes for forming said ring groove and said radially outwardly bulging space is accomplished by radially spreading segments of said forming core while withdrawing said sleeve.

4,157,373
APPARATUS FOR THE PRODUCTION OF RIBBON SHAPED CRYSTALS

Samuel Berkman, Florham Park; Kyong-Min Kim, E. Windsor, and Harold E. Temple, Trenton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 680,072, Apr. 26, 1972, abandoned. This application Oct. 20, 1977, Ser. No. 844,139
Int. Cl.[2] B01J *17/18*
U.S. Cl. 422—246 **4 Claims**



1. In a crystal growing apparatus of the type adapted to pull a ribbon shaped crystal from a melt of the same downwardly through a shaping guide, an improved shaping guide which comprises:

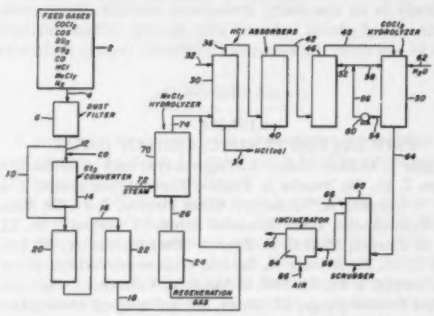
a die set having a "V" shaped longitudinal trough for containing said melt, said trough having a lower apex and an upper base wherein the length of said trough is at least as great as the width of the ribbon to be pulled downward through said shaping guide and the inner wall of said trough has a longitudinal slit in said apex for pulling said ribbon shaped crystal, and a "V" shaped longitudinal susceptor which surrounds and supports said die set; and

a radio frequency heating coil with a plurality of turns substantially surrounding said "V" shaped trough and susceptor, wherein the apex of said "V" shaped trough and susceptor are more remote from said heating coils than the edges of said upper base of said "V" shaped trough and susceptor, said coil in combination with said "V" shaped longitudinal susceptor being suitable for heating said melt in said trough such that the melt at the apex of said trough is at about the melting temperature of the material of the melt while the temperature of the melt between the apex and the melt surface is greater than the melting temperature, thereby providing a temperature gradient.

4,157,374
DISPOSAL OF WASTE GASES FROM PRODUCTION OF ALUMINUM CHLORIDE

Lee G. Carpenter, Murrysville; Vito Cedro, III, Pittsburgh, and Donald L. Kinosz, Lower Burrell, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 765,346, Feb. 3, 1977, abandoned. This application Dec. 12, 1977, Ser. No. 859,927
Int. Cl.[2] C01B *7/00*
U.S. Cl. 423—210 **12 Claims**



1. A process for the purification of waste gases containing $COCl_2$, and up to 15% by weight gaseous metal chlorides capable of hydrolyzing to form HCl and the corresponding metal oxides which comprises:

A. Removing the metal chlorides from the waste gases by:

(1) passing the waste gases through a bed of activated carbon to remove the gaseous metal chlorides;

(2) passing stripping gas through the activated carbon bed to remove the metal chlorides deposited on the bed;

(3) passing the stripping gas and gaseous metal chlorides through a bed of solid particles selected from the class consisting of carbon or metal oxides of the groups IIA, IIIA, IVA, IVB, and mixtures thereof while contacting the gases with water vapor at a temperature of 100°–150° C. to convert said metal chlorides to HCl and the corresponding metal oxides;

B. Removing HCl from the waste gas by contacting the waste gases with liquid water at a temperature of from 20°–100° C. to remove HCl vapors therefrom; and

C. Removing $COCl_2$ from the waste gas by passing the waste gases through a bed of activated carbon in the presence of water to hydrolyze $COCl_2$ in the gases to HCl and CO_2.

9. The process of claim 1 wherein the waste gases also contain sulfur dioxide which is removed by scrubbing in a scrubber maintained at a pH of about 5.6 by addition of sufficient NaOH or Na_2CO_3 to selectively remove sulfur dioxide after the $COCl_2$ hydrolysis step.

10. The process of claim 9 wherein the waste gas also contains partially oxidized carbon compounds and the scrubbed gases are incinerated to oxidize any partially oxidized carbon compounds to CO_2.

4,157,375

CONVERSION OF NITROGEN OXIDES

Stanley M. Brown, Scotch Plains, and Gerald M. Woltermann, North Plainfield, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Menlo Park, Edison, N.J.

Continuation-in-part of Ser. No. 856,658, Dec. 2, 1977. This application Mar. 30, 1978, Ser. No. 891,503

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—239 10 Claims

1. In a process for reducing oxides of nitrogen contained in an exhaust gas by passing said gas in admixture with a gaseous reducing agent in contact with a synthetic zeolitic molecular sieve catalyst at an elevated temperature above about 200° C., the improvement which comprises contacting said gas at a space velocity of 3,000 to 60,000 volumes of gas per volume of catalyst per hour and a temperature below about 700° C. with said catalyst in the form of a monolithic body having channels extending therethrough, said body consisting essentially of fine crystals of a synthetic zeolite molecular sieve formed in situ by calcining a monolithic body of kaolin, treating the calcined body of kaolin with a caustic solution to develop a synthetic zeolitic molecular sieve therein and etch the surfaces thereof, said crystals of molecular sieve being disseminated throughout said body in an essentially amorphous alumina-silica porous residue of anhydrous calcined clay having etched diffusion paths to and from the embedded synthetic zeolitic molecular sieve.

4,157,376

PROCESS FOR PURIFICATION OF GASES

Alexandr I. Vulikh; Maina K. Zagorskaya, both of ulitsa Firsova, 2, kv. 64; Natalia A. Fokina, Kasimovskoe shosse, 17a, kv. 4; Gennady A. Nikandrov, ulitsa Firsova, 2, kv. 10; Lidia A. Reznichenko, ulitsa Sovetskoi Armii, 17, korpus 2, kv. 11, all of Ryazan; Mikhail P. Zverev, ulitsa Novatorov, 18, korpus 2, kv. 24; Arkady N. Barash, Graivoronovsakaya ulitsa, 16, korpus, 4, kv. 53, both of Moscow; Valentina I. Surkova, ulitsa Tsiolkovskogo, 21/20, kv. 20, Kaliningrad Moskovskoi oblasti; Alexei M. Mavrin, ulitsa Sovetskaya, 7, kv. 10; Nikolai V. Troyan, ulitsa Kultury, 10, kv. 10, both of Polevskoi Sverdlovskoi oblasti; Nadezhda F. Kalyanova, ulitsa Lenina, 12, kv. 25, Schelkovo Moskovskoi oblasti; Ivan G. Shimko, ulitsa Rudnevoi, 4/13, kv. 24, Moskow; Alexandr A. Alovyainikov, ulitsa Firsova, 2, kv. 10, Ryazan, and Lev I. Pechalin, ulitsa Pervomaiskaya, 21, kv. 5, Mytischi Moskovskoi oblasti, all of U.S.S.R.

Filed Oct. 4, 1977, Ser. No. 839,346

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—240 5 Claims

1. A process for the removal of acidic gases selected from the group consisting of hydrogen fluoride and hydrogen chloride, comprising passing the gas being treated through an anion-exchange sorbent composed of a textured chemisorption fiber comprising polymers selected from the group consisting of carbo-chain polymers with aliphatic amino groups and carbo-chain polymers with vinylpyridine groups, followed by aqueous regeneration of the anion-exchange sorbent.

4,157,377

PROCESS FOR PRODUCING CALCIUM FLUOBORATE

Francis E. Evans, Hamburg; Charles J. Lind, Gowanda; Richard E. Eibeck, Orchard Park, and Martin A. Robinson, East Amherst, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Sep. 5, 1978, Ser. No. 939,576

Int. Cl.[2] C01B *11/24, 35/06*

U.S. Cl. 423—276 5 Claims

1. In the process for preparing $Ca(BF_4)_2$ by reacting, in an aqueous medium, CaF_2, HF and H_3BO_3; the improvement which comprises removing water from the $Ca(BF_4)_2$ reaction product by purging the reaction product with a dry inert gas at a temperature between about 140° to 170° C.

4,157,378

PROCESS FOR PREPARING FLUORAPATITE

Kenneth Tomlinson, Bramhall, and Edward J. Duff, Sandbach, both of England, assignors to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 653,998, Jan. 19, 1976, Pat. No. 4,048,300, which is a continuation of Ser. No. 431,945, Jan. 9, 1974, abandoned. This application Jun. 2, 1977, Ser. No. 802,758

Claims priority, application United Kingdom, Jan. 11, 1973, 1633/73; Jul. 25, 1973, 35459/73; Jul. 25, 1973, 35471/73

Int. Cl.[2] C01B *25/10, 15/16, 25/26*

U.S. Cl. 423—301 3 Claims

1. The process of preparing analytically pure fluorapatite comprising reacting dicalcium phosphate dihydrate with hydrogen fluoride in aqueous solution, at a pH of from about 5 to about 8, at from about room temperature for about 7 days to about 100° C. for about 2 days, the amount of fluoride ion being from about stoichiometric to about 1.1 times the stoichiometric amount of dicalcium phosphate dihydrate whereby solid analytically pure fluorapatite is formed.

4,157,379

PROCESS FOR PRODUCING CHAIN STRUCTURED CORPUSCULAR CALCIUM CARBONATE

Junji Arika; Masaru Takitani; Keiji Mitarai, and Kazuaki Yamamoto, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Continuation-in-part of Ser. No. 786,190, Apr. 11, 1977, abandoned. This application Nov. 30, 1977, Ser. No. 856,114

Int. Cl.[2] C01F *11/18*

U.S. Cl. 423—430 8 Claims

1. In a process for producing chain structured corpuscular calcium carbonate, an improvement which comprises a first carbonation of calcium hydroxide in a form of an aqueous suspension containing 0.1 to 20 wt. parts of a chelating agent for CaOH per 100 wt. parts of calcium hydroxide to form a viscous colloidal suspension and a second carbonation of the resulting viscous colloidal suspension containing 0.0001 to 0.5 mole of a water soluble metal salt which forms a water insoluble precipitate in an aqueous suspension of calcium hydroxide per 1 mole of calcium hydroxide as the starting material, carrying out the carbonation to be pH of 7 to 8 at the temperature of the aqueous suspension of 0° to 30° C. during the first and second carbonations, whereby chain-structured corpuscular calcium carbonate having an aspect ratio of length to diameter of from 5 to 50 and a primary particle average diameter of 0.01 to 0.1μ is produced.

4,157,380

RECOVERY OF HYDROGEN CHLORIDE AND CHLORINE FROM CHLORINE-CONTAINING ORGANIC WASTES

Walter H. Prahl, Pfaffstrasse 16, Karlsruhe, Fed. Rep. of Germany (41)

Filed Nov. 26, 1976, Ser. No. 745,290

Int. Cl.[2] B01D *53/34;* C01B *7/08;* C07C *17/00*

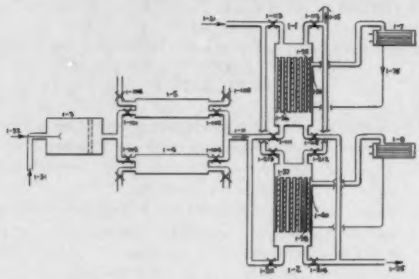
U.S. Cl. 423—488 18 Claims

1. The process of removing chlorine and hydrogen chloride from a combustion gas formed from the incineration of chlorine-containing organic materials which comprises the following separate steps:

(1) The absorbing step of contacting, in the presence of oxygen, said combustion gas at a temperature below about 300° C., with a solid granular mass containing cuprous chloride in a quantity sufficient to absorb chlorine and hydrogen chloride present in the gas and to convert cuprous copper to cupric copper; and

(2) The regeneration step of contacting cupric copper formed in (1) with a reducing agent capable of regenerat-

ing cupric copper to cuprous copper and forming a chlorinated reducing agent; and



(3) The step of disposing of said treated combustion gas in an environmentally unobjectionable manner.

4,157,381

PROCESS FOR REGENERATION OF SULFURIC ACID

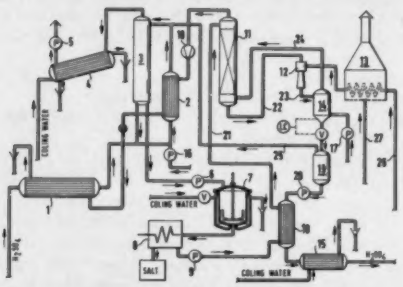
Kurt Bodenbenner, Wiesbaden; Gerhard Müller, Kelkheim, and Heinrich Müller, Neu-Isenburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 817,424, Jul. 20, 1977, abandoned. This application Sep. 14, 1978, Ser. No. 942,264

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2632989

Int. Cl.[2] C01B *17/90, 17/72*

U.S. Cl. 423—525 **4 Claims**



1. A process for the regeneration of dilute sulfuric acid containing organic impurities comprising concentrating the dilute acid in a first step by indirect heat exchange with vapors produced in a second step, concentrating the acid leaving the first step in the second step with a countercurrent flow of a steam and acid vapor mixture produced in a third step, treating the acid from the second step in the third step by atomizing said acid in a stream of superheated steam of a temperature of about 600° to 700° C., recoving the resultant mixture at a temperature between about 285° C. and 300° C., at an acid concentration of about 93 to 96%, separating said acid at said acid concentration introducing the remaining steam and acid vapor mixture from the third step into the second step, and adding an oxidizing agent to at least one of the first, second or third steps.

4,157,382

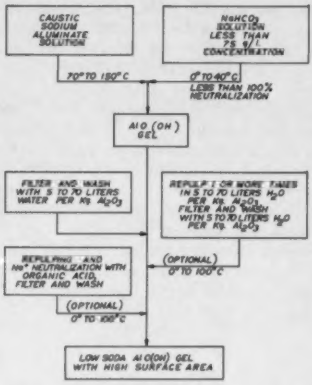
PROCESS FOR PREPARING LOW SODA PSEUDOBOEHMITE GEL

Kenneth P. Goodboy, Pittsburgh, Pa., and James J. Koenig, Belleville, Ill., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 21, 1978, Ser. No. 898,616

Int. Cl.[2] C01F *7/14*

U.S. Cl. 423—628 **6 Claims**


CAUSTIC SODIUM ALUMINATE SOLUTION
NaHCO3 SOLUTION LESS THAN 75 g/l CONCENTRATION
70° TO 150° C
0° TO 40° C
LESS THAN 100% NEUTRALIZATION
Al O (OH) GEL
FILTER AND WASH WITH 5 TO 20 LITERS WATER PER Kg Al2O3
REPULP 1 OR MORE TIMES IN 5 TO 20 LITERS H2O PER Kg Al2O3 FILTER AND WASH WITH 5 TO 20 LITERS H2O PER Kg Al2O3
REPULPING AND Na+ NEUTRALIZATION WITH ORGANIC ACID, FILTER AND WASH
(OPTIONAL) 0° TO 100° C
(OPTIONAL) 0° TO 100° C
LOW SODA Al O(OH) GEL WITH HIGH SURFACE AREA

1. A process for making a pseudoboehmite gel having a BET surface area of at least 325 m^2/g and a Na_2O content less than 3% by weight which consists of:

(a) reacting $NaAlO_2$ solution with a sufficient amount of a $NaHCO_3$ solution having a concentration of less than 75 grams/liter to neutralize approximately 95% of the Na^+ in said $NaAlO_2$ to form a low Na_2O content pseudoboehmite gel while inhibiting the formation of dawsonite;

(b) filtering the gel slurry to recover a gel filter cake; and

(c) repulping and washing the resultant AlO(OH) product to further lower the Na_2O content.

6. A process for making a pseudoboehmite gel having a BET surface area of at least 325 m^2/g and Na_2O content less than 3% by weight which comprises:

(a) reacting a $NaAlO_2$ solution with a sufficient amount of a $NaHCO_3$ solution having a concentration of less than 75 grams/liter to neutralize approximately 95% of the Na^+ in said $NaAlO_2$ to form a low Na_2O content pseudoboehmite gel while inhibiting the formation of dawsonite;

(b) filtering the gel slurry to recover a gel filter cake;

(c) pulping and washing the resultant AlO(OH) product to further lower the Na_2O content; and

(d) repulping the washed AlO(OH) in water at a pH of 5–8 and neutralizing with a carboxylic acid containing 1–6 carbon atoms to further lower the Na_2O content to less than 3% and/or to increase the surface area.

4,157,383

TANNED THROMBOCYTES

Hans-Harald Sedlacek; Roloff Johannsen; Fritz Seiler, and Hermann Karges, all of Marburg, Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Oct. 13, 1976, Ser. No. 732,134

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1975, 2546166

Int. Cl.[2] A01N *1/02;* **G01N** *1/00, 31/00, 33/16*

U.S. Cl. 424—3 **7 Claims**

1. In a test method for the detection of antigens or antibodies of thrombocytes by the formation of immune complexes using thrombocytes as a diagnostic reagent, the improvement wherein said thrombocytes are tanned by suspending freshly-obtained thrombocytes in an isotonic, approximately neutral,

aqueous solution containing a protective colloid and treating them with a tanning agent.

4,157,384

COMPOSITIONS HAVING A PHYSIOLOGICAL COOLING EFFECT

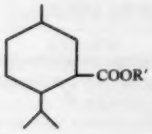
Hugh R. Watson, Wargrave; David G. Rowsell, Staines, and John H. D. Browning, Wokingham, all of England, assignors to Wilkinson Sword Limited, London, England

Division of Ser. No. 486,675, Jul. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 221,753, Jan. 28, 1972, abandoned. This application Sep. 29, 1977, Ser. No. 837,900

Int. Cl.[2] A61K *7/16, 31/19*

U.S. Cl. 424—45 **15 Claims**

1. In a consumer product for application to or consumption by the human body comprising a consumer product base and, as adjuvants in said base, (i) at least one of the following: a flavourant, colourant, perfuming agent, surface active agent, antiseptic or pharmaceutically active agent, and (ii) an ingredient capable of stimulating the cold receptors of the nervous system of the surface tissues of the body in those parts of the human body with which the product comes in contact during use, the improvement which comprises using as the cold receptor stimulating ingredient an effective amount of a cold receptor stimulating compound of the formula:



where R' is H or an aliphatic radical of up to 10 carbon atoms selected from: mono- and poly-hydroxyalkyl and cycloalkyl radicals containing from 2 to 10 carbon atoms and having a hydroxyl group in one or more of the 2- and 3-positions and a hydrogen atom in the 1-position; (2,2-dimethyl-1,3-dioxolan-4-yl)methyl; an acylated derivative of a mono- or poly-hydroxyalkyl radical of 2–9 carbon atoms and having a hydroxyl group in a 2- or 3-position and a hydrogen atom in the 1-position with a lower alkanoic acid; aryl hydrocarbon radicals of up to 10 carbon atoms and containing a hydroxyl substituent in a 2- or 3-position relative to the ester grouping; carboxyalkyl radicals containing a carboxyl group in the 1-, 2- or 3-position; an alkali metal, alkaline earth metal, ammonium or ethanolamine salt of such a carboxyalkyl radical; and lower alkyl esters of such carboxyalkyl radicals.

4,157,385

PLAQUE INHIBITING COMPOSITION AND METHOD

Austin C. Wagenknecht, deceased, late of Hennepin County, Minn. (by Don A. Wagenknecht, personal representative); George V. Daravingas, Edina, and William E. Koski, Minneapolis, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Nov. 28, 1977, Ser. No. 855,536

Int. Cl.[2] A61K *7/16, 9/68*

U.S. Cl. 424—48 **12 Claims**

1. A chewing gum comprising:

(a) from about 0.001% to about 15% by weight of an alkyl sulfate salt;

(b) from about 0.001% to about 15% by weight of a di(2-ethylhexyl)sulfosuccinate salt;

(c) from about 0.001% to about 5% by weight of a zinc compound;

(d) from about 0.05% to about 10% by weight of a plaque inhibiting flavor selected from the group consisting of cinnamon oil, peppermint oil, and spearmint oil and mixtures thereof; and,

(e) from about 10% to about 95% by weight of a gum base.

4,157,386

SOFT, CHEWABLE LOZENGE FORMING A STICKY COATING ON TEETH WHEN COMBINED WITH SALIVA IN THE MOUTH WHICH IS REMOVABLE ONLY BY BRUSHING

Paul J. La Rochelle, 427 Beech St., Holyoke, Mass. 01040

Filed May 18, 1978, Ser. No. 907,167

Int. Cl.[2] A61K *7/18*

U.S. Cl. 424—52 **9 Claims**

1. A soft, chewable lozenge delivering to the mouth a composition forming a sticky coating on the teeth when combined with saliva and completely removable from the teeth only by brushing, said composition comprising:

a water-containing, non-cariogenic sweetener in an amount of about 20% to 36% by weight selected from the group consisting of xylitol, lycasin, mixtures of xylitol and sorbitol and mixtures of lycasin and sorbitol serving as the sole sweetening agent;

a cleaner-polisher for the teeth in an amount of from about 30% to 60% by weight, which is greater than the amount of said sweetener;

a starch adhesive in an amount of about 5% to 10% by weight; and

a viscosity builder and softening agent comprising an unsaturated vegetable oil which physically softens the mixture of cleaner-polisher and sweetener while interacting physically with the starch adhesive to thicken the composition and enhance adhesion to the teeth.

4,157,387

DENTIFRICE COMPOSITION CONTAINING AN ABRASIVE COATED WITH A CATIONIC WATER SOLUBLE POLYMER

James J. Benedict, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 677,592, Apr. 16, 1976, Pat. No. 4,110,083, which is a continuation of Ser. No. 471,941, May 21, 1974, abandoned. This application May 1, 1979, Ser. No. 920,309

Int. Cl.[2] A61K *7/16, 7/22*

U.S. Cl. 424—54 **11 Claims**

1. A dentifrice composition comprising:

(A) from about 4% to about 95% of a coated dentifrice abrasive comprising:

(a) a hard mineral substance having a hardness on the Mohs' scale of 2 or more and a particle size of from about 1 micron to about 30 microns;

(b) as a coating for said hard mineral substance, from about 2% to about 25% by weight, based on the weight of said hard mineral substance, of a cationic water-soluble polymer having a charge density of at least 0.003 and a molecular weight of from about 500 to about 1,000,000, said polymer being selected from the group consisting of:

(i) polyacryloxyalkyl ammonium salts;

(ii) polymethacryloxyalkyl ammonium salts;

(iii) polyacryloamido alkyl ammonium salts;

(iv) polyalkenyl ammonium salts;

(v) polyvinyloxy ammonium salts;

(vi) polyvinylbenzyl ammonium salts;

(vii) polydiallyl ammonium salts;

(viii) polyvinyl pyridinium ammonium salts;

(ix) polyvinylimidazolium salts;

(x) polyalkylation quaternaries;

(xi) poly condensation quaternaries; and

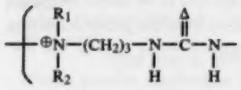
(B) from about 0.01% to about 5% of a cationic therapeutic agent.

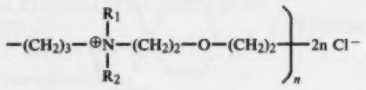
4,157,388
HAIR AND FABRIC CONDITIONING COMPOSITIONS CONTAINING POLYMERIC IONENES

Arvid Christiansen, Basking Ridge, N.J., assignor to The Miranol Chemical Company, Inc., Irvington, N.J.

Filed Jun. 23, 1977, Ser. No. 809,484
Int. Cl.[2] A61K *7/06, 7/08;* **D06M** *15/12*
U.S. Cl. 424—70 **4 Claims**

1. A hair conditioning composition comprising an effective amount of a compound of the formula





wherein Δ is selected from the group consisting of S and O, n is at least one and R_1 and R_2 may be the same or different and are selected from the group consisting of methyl, ethyl, isopropyl, 2-hydroxyethyl and $—CH_2CH_2(OCH_2CH_2)_xOH$ wherein x may be 0 to 6; fatty anionic surfactants, and a conventional carrier agent for hair conditioning compositions.

4,157,389
MIXED VACCINE AGAINST INFECTIONS BY PSEUDOMONAS AERUGINOSA

Yuzuru Homma, Tokyo, and Kazuyuki Morihara, Osaka, both of Japan, assignors to The Kitasato Institute and Shionogi & Co., Ltd., both of, Japan

Filed Jan. 28, 1977, Ser. No. 763,538
Claims priority, application Japan, Feb. 5, 1976, 51-10838
Int. Cl.[2] A61K *37/48, 39/02*
U.S. Cl. 424—92 **11 Claims**

1. A mixed vaccine against infections caused by *Pseudomonas aeruginosa* which comprises as the antigen, an elastase toxoid obtained from *Pseudomonas aeruginosa* which is formaldehyde or oxymethanesulfinic acid deactivated, and purified by lyophilization and dialysis, said elastase toxoid having the following properties

(1) molecular weight: 47,000 (gel filtration);
(2) ultraviolet ray absorption spectrum: maximum 278 mμ ($E_{1\%}^{278}$=21.2, 0.1 M KCl), minimum 252 mμ;
(3) Isoelectric point: pH 6.5 (electrophoresis with acetate film);
(4) appearance: colorless powder;
(5) composition of amino acid: residues of amino acids (g/100 g protein); aspartic acid (14.2), threonine (5.0), serine (5.6), glutamic acid (6.5), proline (2.9), glycine (5.6), alanine (5.8), valine (4.9), methionine (2.9), isoleucine (2.7), leucine (4.3), tyrosine (9.9), phenylalanine (7.0), lysine (3.9), histidine (2.6), arginine (6.5), cystine/2 (1.2), tryptophane (2.3), ammonia (0.9) (total 94.7 g);
(6) elastase activity: none;
(7) antigen activity: observed; and a protease toxoid which is also obtained from *Pseudomonas aeruginosa* which has been deactivated with formaldehyde or oxymethanesulfinic acid in the presence of an amino acid, and which is then purified by dialysis and lyophilization said protease toxoid having the following properties:
(1) molecular weight: 63,000 (gel filtration);
(2) ultraviolet ray absorption spectrum: maximum 280 mμ ($E_{1\%}^{280}$=9.27, 0.1 M KCl), minimum 250 mμ;
(3) isoelectric point: pH 5.2 (focal electrophoresis);
(4) appearance: colorless powder;
(5) composition of amino acid: residues of amino acids (g/100 g protein); aspartic acid (15.6), threonine (5.0), serine (7.6), glutamic acid (9.5), proline (2.1), glycine (7.7), alanine (8.5), valine (5.0), isoleucine (3.9), leucine (8.7), tyrosine (6.9), phenylalanine (5.9), lysine (4.1), histidine (1.9), arginine (2.3), triptophane (2.3), ammonia (1.4) (total 98.5 g).
(6) protease activity: none;
(7) antigen activity: observed.

4,157,390
PROCESS FOR VACCINE PREPARATION

Stephen H. Parry, and Philip Porter, both of Bedford, England, assignors to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

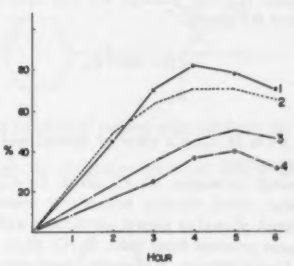
Continuation of Ser. No. 794,384, May 6, 1977, which is a continuation of Ser. No. 694,613, Jun. 10, 1976, abandoned. This application Jul. 24, 1978, Ser. No. 927,577
Claims priority, application United Kingdom, Jun. 12, 1977, 25221/77
Int. Cl.[2] A61K *39/02*
U.S. Cl. 424—92 **3 Claims**

1. A process for the preparation of a vaccine for parenteral administraion to pregnant mammals as a means for reducing the incidence of neonatal diarrhoea, in which process K88a,b-/adhesion factor of an enteropathogenic strain of *E. coli* is adsorbed from a cell-free aqueous solution onto erythrocytes possessing their natural surface characteristics, the ratio of adsorbed K88a,b/adhesion factor to the volume of erythrocytes present being in the range 125 to 800 hemagglutination units per ml, and the composition so formed is rendered storable by the addition thereto of a preservative such as sodium azide or formalin.

4,157,391
CHOLESTEROL DERIVATIVE-BASED MEDICAMENTS ACTING ON BIO-PROTECTIVE MECHANISMS

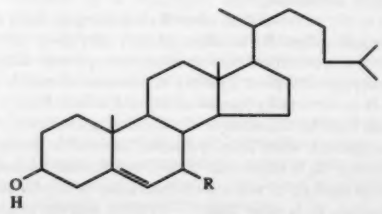
Fumio Kitame; Hiroshi Saitoh, and Nakao Ishida, all of Sendai, Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Jun. 7, 1977, Ser. No. 804,239
Claims priority, application Japan, Feb. 23, 1977, 52/18939
Int. Cl.[2] A61K *31/56*
U.S. Cl. 424—238 **7 Claims**



1. A medicament having an immuno regulatory action, which comprises a cholesterol derivative expressed by the following general formula:

(I)



where R represents —OH or =O, and physiologically acceptable carrier, said medicament containing 10 to 1,000 mg of the cholesterol derivative, the cholesterol derivative being present in an amount of 1.0 to 60% by weight of the medicament.

4,157,392

PHARMACOLOGICALLY ACTIVE SUBSTITUTED 1,2,4-TRIAZINES

James M. Gullo, Perry; William P. Heilman, Chagrin Falls; Robert J. Wayner, Fairport Harbor, and Robert E. Moser, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 797,676, May 17, 1977, abandoned. This application Apr. 19, 1978, Ser. No. 897,803

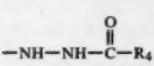
Int. Cl.[2] **C07D** *253/06;* **A61K** *31/53*

U.S. Cl. 424—249 **13 Claims**

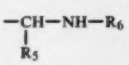
1. A compound selected from the group consisting of compounds of the formula

wherein

R_1 is C_1–C_4 hydroxy alkylamino, N-(C_1–C_2 alkyl)-N-(hydroxy C_1–C_4 alkyl)amino, C_1–C_4 alkyl, C_1–C_{10} alkoxy, C_6–C_{10} aryloxy, C_3–C_6 cycloalkoxy, phenyl alkoxy, allyloxy, halophenoxy, C_1–C_4 alkyl phenoxy, C_1–C_4 alkoxy phenoxy, C_1–C_{10} alkylthio, C_3–C_6 cycloalkylthio, C_1–C_4 alkyl sulfinyl, C_1–C_4 alkyl sulfonyl, phenyl C_1–C_4 alkylthio, dimethylpyrrolidyl, hydrazino, C_1–C_4 alkyl hydrazino, or the group



where R_4 is C_1–C_8 alkyl, C_1–C_8 alkenyl, halo (C_1–C_8) alkyl, halo (C_1–C_8) alkenyl, C_6–C_{10} cycloalkyl or R_4 represents the group



where R_5 is H, C_1–C_4 alkyl or benzyl and R_6 is H or carbobenzyloxy;

R_2 represents hydrogen, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, adamantyl, furyl, thienyl, benzofuryl, indolyl, pyridyl, halothienyl, phenyl or phenyl substituted with at least one substituent selected from halo, C_1–C_6 alkyl, halo C_1–C_6 alkyl, C_1–C_6 alkoxy, acetamido, benzyloxy, diphenylmethyl, morpholino, methylene dioxy or nitro;

and R_3 represents hydrogen, C_1–C_6 alkyl, pyridyl, furyl, phenyl or phenyl substituted with at least one substituent selected from halo, C_1–C_6 alkyl, C_1–C_6 alkoxy, methylene dioxy or acetamido;

subject to the provisos that when R_2 is hydrogen, R_3 is also hydrogen; when R_1 is alkyl, phenyl alkylthio, alkoxy, alkylthio, cycloalkylthio, cycloalkoxy, phenyl alkoxy, dimethylpyrrolidyl or hydroxy alkylamino or said N-(alkyl)-N-(hydroxyalkyl)amino as defined before, R_2 and R_3 cannot both be halophenyl, C_1–C_3 alkyl phenyl or C_1–C_3 alkoxyphenyl; when R_1 is hydrazino, methylthio, methoxy or ethoxy, R_2 is other than phenyl and R_2 and R_3 cannot both be methyl; or when R_1 is hydrazino or C_1–C_4 alkylhydrazino, R_2 is other than C_1–C_4 alkyl; and the pharmaceutically acceptable salts thereof.

4,157,393

N-ARYL-N-(1-L-4-PIPERIDINYL)-ARYLACETAMIDES

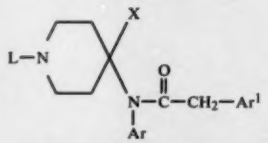
Stefan Sanczuk, Vosselaar, and Hubert K. Fr. Hermans, Gierle, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 795,669, May 11, 1977, Pat. No. 4,126,689, which is a continuation-in-part of Ser. No. 713,756, Aug. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,131, Sep. 23, 1975, abandoned. This application Jul. 13, 1978, Ser. No. 924,533

Int. Cl.[2] **C07D** *211/58;* **A61K** *31/445*

U.S. Cl. 424—251 **7 Claims**

1. A chemical compound selected from the group consisting of an N-aryl-N-(4-piperidinyl)arylacetamide having the formula



and the pharmaceutically acceptable acid addition salts thereof, wherein:

L is cycloalkyl having 3 to 6 carbons;

Ar is a member selected from the group consisting of pyridinyl and 2-pyrimidinyl;

Ar^1 is a member selected from the group consisting of phenyl, mono- and di-substituted phenyl, wherein each substituent in said mono- and di-substituted phenyl is independently selected from the group consisting of halo, lower alkyl, hydroxy and lower alkyloxy; and

X is a member selected from the group consisting of hydrogen lower alkyloxycarbonyl and lower alkyloxymethyl.

4,157,394

CARDIO-PROTECTIVE PHARMACEUTICAL COMPOSITION

Albrecht Fleckenstein, Ulrich; Johanna Janke, Freiburg; Klaus Lossnitzer, Bad Kissingen, and Karl-Dieter Voelger, Darmstadt, all of Fed. Rep. of Germany, assignors to Rohm Pharma GmbH, Darmstadt, Fed. Rep. of Germany

Filed Dec. 19, 1977, Ser. No. 862,033

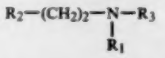
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658500

Int. Cl.[2] **A61K** *31/505, 31/44, 31/275*

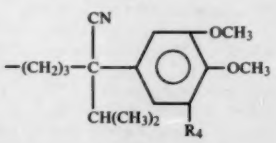
U.S. Cl. 424—251 **5 Claims**

1. A cardio-protective pharmaceutical composition comprising an inert carrier and a pharmaceutically-effective amount of a combination of 2,4,7-triamino-6-phenyl-pteridine and a calcium antagonist.

2. A composition as in claim 1 wherein said calcium antagonist is a compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein R_1 is hydrogen or methyl; R_2 is benzhydryl or 3,4-dimethoxyphenyl; and R_3 is $—CH(CH_3)—(CH_2)_n—C_6H_5$ wherein n is 0 or 1, or is



wherein R_4 is hydrogen or methoxy; but wherein R_1 is hydrogen if the compound contains unsubstituted phenyl or R_1 is methyl if the compound contains methoxy-substituted phenyl.

4,157,395

BENZENESULFONYL UREAS

Volker Hitzel, Hofheim am Taunus; Rudi Weyer, Kelkheim; Werner Pfaff, Hofheim am Taunus, and Karl Geisen, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

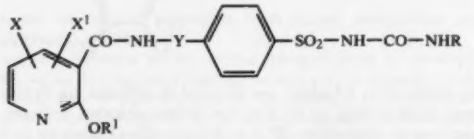
Filed May 8, 1978, Ser. No. 903,548

Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720926

Int. Cl.[2] **C07D** *213/56;* **A61K** *31/44*

U.S. Cl. 424—266 **9 Claims**

1. Benzenesulfonylurea of the formula



in which

R_1 is alkyl with 3 to 8 carbon atoms, cycloalkyl, cycloalkylalkyl, alkylcycloalkyl, each of which having of from 5 to 9 carbon atoms, phenyl, which may be mono- or disubstituted by alkyl or alkoxy each of which having up to 4 carbon atoms, or by halogen, phenylalkyl with up to 3 carbon atoms in the alkyl moiety, which may be mono- or di-substituted in the phenyl nucleus by alkyl or alkoxy each having up to 4 carbon atoms, or by halogen,

X and X^1 each is hydrogen, alkyl with up to 4 carbon atoms, alkoxy with up to 2 carbon atoms, halogen,

Y is alkylene with 2 to 3 carbon atoms,

R is alkyl with 1 to 6 carbon atoms, cycloalkyl, alkylcycloalkyl, cycloalkylalkyl, cycloalkenyl, alkylcycloalkenyl each having of from 5 to 9 carbon atoms, alkylcyclopentylmethyl, cyclohexenylmethyl, chlorocyclohexyl, bicycloheptenylmethyl, bicycloheptylmethyl, bicycloheptenyl, bicycloheptyl, nortricyclyl, adamantyl, benzyl

or a physiologically acceptable salt thereof.

4,157,396

HYDROXAMIC ACID DERIVATIVES AND MEDICAMENTS FOR TREATMENT OF UROLITHIASIS AND PYELONEPHROSIS COMPRISING SUCH DERIVATIVES

Satoru Tanaka, Higashi-Kurume, and Keiichi Munakata, Yono, both of Japan, assignors to Eisai Co., Ltd., Japan

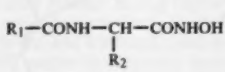
Division of Ser. No. 769,847, Feb. 17, 1977, Pat. No. 4,083,996. This application Jan. 26, 1978, Ser. No. 872,581

Claims priority, application Japan, Feb. 20, 1976, 51-16988; Jun. 10, 1976, 51-67077; Jun. 10, 1976, 51-67078

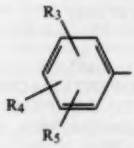
Int. Cl.[2] **A61K** *31/455;* **C07D** *213/56*

U.S. Cl. 424—266 **7 Claims**

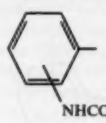
1. A compound having the general formula:



wherein R_1 is a substituted phenyl group represented by a formula:



wherein R_3, R_4 and R_5 are selected from the group consisting of hydrogen and a lower alkoxy group, provided that at least two of them are lower alkoxy groups, which are linked with each other to form an alkylene dioxy group; a carbonylaminophenyl group represented by a formula:



wherein R_6 is a lower alkyl group; and a heterocyclic residue selected from the group consisting of furan, thiophene and pyridine, and R_2 is hydrogen or a methyl group, provided that when R_1 is a carbonoylaminophenyl group, the R_2 is hydrogen, and its salt of a pharmacologically acceptable base.

6. A method for treating urolithiasis which comprises administering to a patient suffering from urolithiasis an effective amount for treating the urolithiasis of a compound according to claim 1.

4,157,397

INSECTICIDAL (β-PHENYLVINYL)CYCLOPROPANECARBOXYLATES

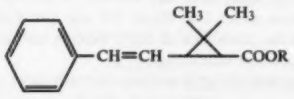
John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Filed Aug. 27, 1976, Ser. No. 718,254

Int. Cl.[2] **C07C** *69/76, 121/64;* **A01N** *9/24*

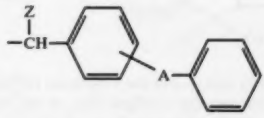
U.S. Cl. 424—274 **8 Claims**

1. An insecticidal compound of the formula:



in which R is an alcohol residue selected from the group consisting of:

(a) a benzyl- or phenoxy-substituted benzyl group of the formula:



wherein Z is hydrogen, methyl, cyano, ethynyl, or phenyl, and Z is —O— or $—CH_2—$;

(b) a benzyl- or phenoxy-substituted furylmethyl group;

(c) an imidomethyl group selected from the group consisting of maleimidomethyl, phthalimidomethyl, and tetrahydrophthalimidomethyl; and

(d) a benzyl group substituted in at least two ring positions with chloro, methyl, or methylenedioxy group.

6. An insecticidal composition comprising an insecticidally effective amount of a compound of claim 1 in admixture with an agriculturally acceptable extender.

8. A method of controlling insects which comprises applying

to the locus where control is desired an insecticidally effective amount of a compound of claim 1.

4,157,398

N-(2-AMINOCYCLOPENTYL)ACYLANILIDES AND TREATING DEPRESSION

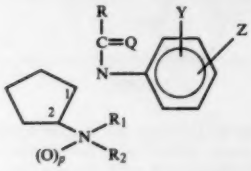
Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 777,599, Mar. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 746,191, Nov. 30, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,379

Int. Cl.[2] **A61K** *31/40, 31/445;* **C07D** *207/12, 211/06*

U.S. Cl. 424—267 **7 Claims**

1. A process for treating depression which comprises administering to a depressed human a compound of the formula



(I)

wherein the wavy line (~) in the 1-position of the cyclopentyl ring indicates cis or trans configuration of the substituents in the 1- and 2-positions of the cyclopentyl ring;

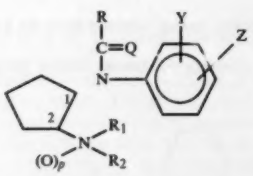
p is zero or 1;

Q is oxygen or sulfur;

R is vinyl, C_3 to C_6-cycloalkyl, ethoxy, or methoxymethyl;

R_1 and R_2 are taken together with the nitrogen to which they are bonded they complete an N-pyrrolidinyl or N-piperidinyl ring; each of Y and Z is selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, C_1 to C_2-alkyl and C_1 C_2-alkyloxy and when Y is trifluoromethyl Z is hydrogen, when Y is C_1 to C_2-alkyloxy and Z is hydrogen the C_1 to C_2-alkyloxy is in the 3-position, when Y and Y and Z are both halogens or C_1 to C_2-alkyloxy they are present in the 3- and 4- or 3- and 5-positions, or a pharmacologically acceptable salt thereof, in an amount in the range from about 1 to about 100 mg. per dosage unit to alleviate the conditions of depression, in association with a pharmaceutical carrier.

5. A compound of the formula



(I)

wherein the wavy line (~) in the 1-position of the cyclopentyl ring indicates cis or trans configuration of the substituents in the 1- and 2-positions of the cyclopentyl ring;

p is zero or 1;

Q is oxygen or sulfur;

R is vinyl, C_3 to C_6-cycloalkyl, ethoxy, or methoxymethyl;

R_1 and R_2 are taken together with the nitrogen to which they are bonded they complete an N-pyrrolidinyl or N-piperidinyl ring;

each of Y and Z is selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, C_1 to C_2-alkyl and C_1 to C_2-alkyloxy and when Y is trifluoromethyl Z is hydrogen, when Y is C_1 to C_2-alkyloxy and Z is hydrogen the C_1 to C_2-alkyloxy is in the 3-position, when Y and Z are both halogens or C_1 to C_2-alkyloxy they are present in the 3- and 4- and 5-positions, and the acid addition salts thereof.

4,157,399

BENZO(b)THIOPHENES

Fritz Sauter, Vienne, Austria, assignor to Parcor, Paris, France

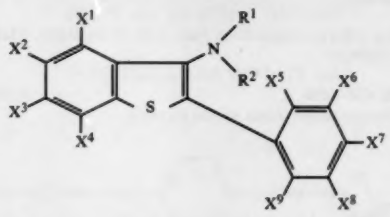
Filed Dec. 5, 1977, Ser. No. 857,134

Claims priority, application Austria, Dec. 23, 1976, 9587/76; Sep. 12, 1977, 6527/77; Jul. 29, 1977, 6528/77

Int. Cl.[2] **A61K** *31/38;* **C07D** *333/66*

U.S. Cl. 424—275 **7 Claims**

1. A benzo (b) thiophene of formula:

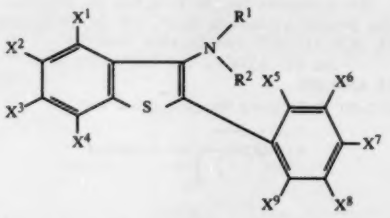


in which X^1 to X^9 which are identical or different are hydrogen, alkyl having up to 3 carbon atoms, chlorine, bromine, methoxy or methylthio, R^1 is hydrogen, alkyl having up to 8 carbon atoms, optionally chlorinated, brominated or methoxylated, phenyl optionally chlorinated or methoxylated, aralkyl having in all up to 9 carbon atoms, optionally chlorinated or methoxylated on the phenyl nucleus, R^2 is hydrogen, phenyl, or a radical of formula:

in which A is two hydrogen atoms or one oxygen atom and R^3 can have the same meanings as given for R^1, R^1 and R^2 being not both hydrogen, the meanings assumed by R^1 and R^3 being independent from one another or the group

forms the radical piperidino, pyrrolidino, morpholino or piperazino which, in the case of piperazino, can, as appropriate, be substituted on the second nitrogen atom by an alkyl having up to 6 carbon atoms, by an aliphatic or aromatic acyl having up to 8 carbon atoms, by an optionally chlorinated or methoxylated phenyl or by an aralkyl optionally chlorinated or methoxylated on the phenyl nucleus, having in all up to 9 carbon atoms, and the pharmaceutically acceptable salts thereof.

6. Hypocholesterolemiant and hypolipemiant pharmaceutical composition in unit dose, each unit dose comprising from 0.05 to 1.5 g of a benzo (b) thiophene of formula:



in which X^1 to X^9 which are identical or different are hydro-

gen, alkyl having up to 3 carbon atoms, chlorine, bromine, methoxy or methylthio, R^1 is hydrogen, alkyl having up to 8 carbon atoms, optionally chlorinated, brominated or methoxylated, phenyl optionally chlorinated or methoxylated, aralkyl having in all up to 9 carbon atoms optionally chlorinated or methoxylated on the phenyl nucleus, R^2 is hydrogen, phenyl, or a radical of formula:

in which A is two hydrogen atoms or one oxygen atom and R^3 can have the same meanings as given for R^1, R^1 and R^2 being not both hydrogen, the meanings assumed by R^1 and R^3 being independent from one another or the group

forms the radical piperidino, pyrrolidino, morpholino or piperazino which, in the case of piperazino, can, as appropriate, be substituted on the second nitrogen atom by an alkyl having up to 6 carbon atoms, by an aliphatic or aromatic acyl having up to 8 carbon atoms, by an optionally chlorinated or methoxylated phenyl or by an aralkyl optionally chlorinated or methoxylated on the phenyl nucleus, having in all up to 9 carbon atoms, and the pharmaceutically acceptable, salts thereof in admixture with a therapeutically acceptable vehicle.

4,157,400

TERPENOPHENOXYALKYLAMINES AND PHARMACEUTICAL COMPOSITIONS AND USES THEREOF

Jean Mardiguian, Saint Maur des Fosses, France, assignor to MAR-PHA, Societe d'Etude et d'Exploitation de Marques, Paris, France

Filed Aug. 8, 1977, Ser. No. 822,726
Claims priority, application France, Aug. 10, 1976, 76 24360
The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.
Int. Cl.[2] A61K *31/135;* **C07C** *93/06*
U.S. Cl. 424—330 **4 Claims**

1. A compound selected from the group consisting of 1-isopropylamino-3-[2-(2-norbornyl exo)phenoxy]propan-2-ol, its isomer: 1-isopropylamino-3-[2-(2-norbornyl endo)phenoxy]-propan-2-ol, and physiologically acceptable non-toxic acid addition salts and quaternary ammonium salts thereof.

2. A pharmaceutical composition active as a beta-blocking agent against tachycardia, as an anti-anxiety, anti-hypertension and anti-spasmodic medicament which comprises a therapeutically effective amount of at least one compound according to claim 1, and a pharmaceutically acceptable non-toxic carrier.

4,157,401

CHEWING GUM HAVING IMPROVED FLAVOR DURATION AND SHELF-LIFE

John J. Stroz, Monroe, Conn.; Abraham I. Bakal, Parsippany, N.J.; Frank Witzel, Spring Valley, and Donald A. M. MacKay, Pleasantville, both of N.Y., assignors to Life Savers, Inc., New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,122
Int. Cl.[2] A23G *3/30*
U.S. Cl. 426—3 **8 Claims**

1. A chewing gum product having improved shelf-life and flavor duration comprising gum base, sweetener, and a mixture of one or more flavors and a limonene derivative, said mixture being substantially uniformly dispersed throughout said gum base, said one or more flavors being present in an amount within range of from about 0.3 to about 2% by weight of the chewing gum, and said limonene derivative being present in an amount within the range of from about 0.1 to about 1.5% by weight of the chewing gum, said limonene derivative inhibiting or minimizing migration of said one or more flavors from said gum base thereby enhancing flavor duration and preserving flexibility of the chewing gum during storage.

4,157,402

CENTER-FILLED CHEWING GUM

Koichi Ogawa, Tokyo; Shichigoro Tezuka, Kawasaki; Masatoshi Terasawa, Tokorozawa, and Shizuo Iwata, Tama, all of Japan, assignors to Lotte Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1978, Ser. No. 875,205
Claims priority, application Japan, Nov. 22, 1977, 52-140418
Int. Cl.[2] A23G *3/30*
U.S. Cl. 426—5 **15 Claims**

1. In a method of making chewing gum having a gum base and a flavored, liquid center fill, the improvement comprising the steps of adding an emulsifier having an HLB value in the range of 3-15 to the center fill in an amount by weight of from 0.01–0.50% by weight of the center fill, and thereafter incorporating the center fill with the emulsifier into the base.

4,157,403

MICROWAVE BAKING OF BROWN AND SERVE PRODUCTS

Robert F. Schiffmann, Manhattan; Alfred H. Mirman, Nanuet; Richard J. Grillo, Hawthorne, all of N.Y., and Sally A. Wouda, Charlottesville, Va., assignors to International Telephone & Telegraph Corporation, Nutley, N.J.

Filed Jul. 12, 1976, Ser. No. 704,270
Int. Cl.[2] A21D *6/00*
U.S. Cl. 426—234 **6 Claims**

1. A method of processing brown and serve rolls comprising the steps of:

preparing a dough;

forming the individual rolls;

placing the rolls in sales cartons;

proofing said rolls for about 7 to 12 minutes utilizing microwave energy having a frequency of 915 MHz and a flux density of about 11 to 34 watt hours per pound; and baking said rolls for about 4 to 6 minutes utilizing microwave energy having a frequency of 915 MHz at an effective flux density.

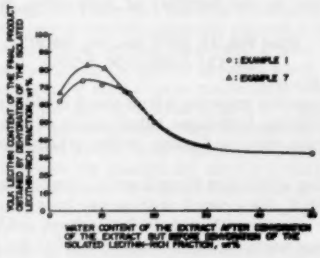
4,157,404

PROCESS FOR OBTAINING YOLK LECITHIN FROM RAW EGG YOLK

Nobumitsu Yano; Itaru Fukinbara, both of Tokyo, and Mitsuo Takano, Imabari, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 28, 1978, Ser. No. 928,979
Int. Cl.[2] A23L *1/28*
U.S. Cl. 426—429 **7 Claims**

FIGURE



1. A process for obtaining yolk lecithin from raw yolk which comprises subjecting raw yolk to extraction with liquid dimethyl ether thereby forming an extraction mixture, the

weight ratio of liquid dimethyl ether to raw yolk being not less than 2:1, followed by separation of yolk proteins from the extraction mixture and removal of the liquid dimethyl ether from the extraction mixture, to obtain an extract comprising lecithin, neutral lipids and water; and dehydrating the extract so that the water content of the extract is not more than 20% by weight, thereby causing the extract to separate into a lecithin-rich fraction and a neutral lipids-rich fraction, followed by isolation of the lecithin-rich fraction.

4,157,405

COCOA BUTTER SUBSTITUTES AND THEIR PREPARATION

Nozomi Yasuda; Kimio Terada; Kazuo Itagaki; Yasuo Toyoshima; Shouji Maruzeni; Tadasu Itoh; Hideo Yokobori, and Susumu Satoh, all of Tokyo, Japan, assignors to Asahi Denka Kogyo K. K., Tokyo, Japan

Filed Jun. 30, 1977, Ser. No. 811,851

Claims priority, application Japan, Jun. 30, 1976, 51-77202; Jul. 19, 1976, 51-85714; Mar. 11, 1977, 52-26851

Int. Cl.[2] A23D *5/02*

U.S. Cl. 426—607 **11 Claims**

5. A process for producing a cocoa butter substitute which comprises treating a crude sal fat obtained from the seeds of Shorea robusta with 0.1 to 0.4% by weight of phosphoric acid based on the weight of said fat for 10–20 minutes at a temperature of 50°–70° C., then removing aggregated gums and mucilaginous materials from said fat, then adding to said fat aqueous alkali solution containing alkali in an amount of from 3 to 10 times the equivalent amount of the alkali required for neutralizing free fatty acids contained in said fat and treating said fat with said alkali for a time sufficient to deacidify said fat and form foots, then removing the foots that are formed by the alkali treatment, then washing said fat with hot water at a temperature above about 70° C. for a time sufficient to remove impurities comprising residual alkali and pigments, then drying said fat, then treating said fat with about 5 to 20% by weight of activated clay based on the weight of said fat to decolorize said fat, then removing the activated clay and materials adsorbed thereon from said fat, then deodorizing said fat by steam distillation at a temperature of 220° to 270° C. for a time sufficient to remove odoriferous materials and thereby obtaining a refined sal fat having a hydroxy value of up to 16, a solid fat index at 30° C. of 48 to 60, a cooling time at which a maximum point appears in the cooling curve in the range of 45 to 120 minutes and the temperature of said maximum point of 17° to 28° C., wherein the cooling curve is obtained by cooling 20 grams of the refined fat from a temperature of 40° C. using the apparatus of FIG. 1 immersed in a water bath at 12° C.

4,157,406

PROCESS FOR IMPROVING BAKING PROPERTIES OF UNBLEACHED CAKE FLOUR

Max M. Hanamoto, Lafayette, and Maura M. Bean, Berkeley, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 15, 1977, Ser. No. 768,917

Int. Cl.[2] A21D *2/36, 6/00*

U.S. Cl. 426—622 **4 Claims**

1. A process for preparing a flour-starch mixture suitable for use in producing high-sugar baked goods of good volume, texture, grain, color, and eating quality, which comprises the steps of

(a) heating unbleached wheat flour at a temperature of about 49°–93° C. for a period of about one hour to ten weeks,

(b) mixing starch with water to form a slurry and heating the slurry at a temperature of about 54°–71° C. for a period of time sufficient to swell the starch granules without causing fragmentation thereof, and

(c) mixing the so-heated flour with the so-treated starch in the proportion of 3 to 15 parts of flour per part of starch.

4,157,407

TONING AND SOLVENT WASHOUT PROCESS FOR MAKING CONDUCTIVE INTERCONNECTIONS

Robert W. Peiffer, Jackson, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 13, 1978, Ser. No. 877,465

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—54 **14 Claims**

1. A process for preparing a two layer printed circuit board having conductive interconnections which comprises:

(a) applying to a substrate bearing an electrically conductive circuit pattern a layer of a photoadhesive composition;

(b) exposing the layer to actinic radiation through a circuit image which is related to the underlying circuit pattern leaving an adherent circuit image having at least one segment thereof overlying at least one segment of the conductive circuit pattern;

(c) applying finely divided metal, alloy or plating catalyst material to the adherent image areas;

(d) exposing the metallized or catalyzed image to actinic radiation through an image of at least one overlying segment of the previous circuit patterns;

(e) removing each overlying segment area with a solvent for the photoadhesive composition; and

(f) plating, or soldering the metallized or catalyzed image to form an electrically conductive circuit pattern interconnected with the underlying circuit pattern.

4,157,408

PRODUCTION OF SPLIT TILE

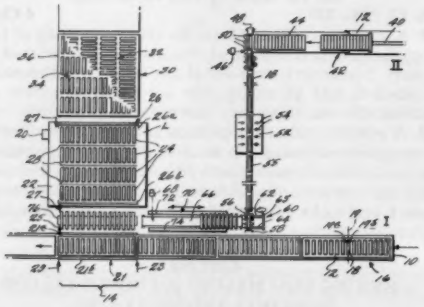
Hans Lingl, Neu-Ulm, Fed. Rep. of Germany, assignor to Lingl Corporation, Paris, Tenn.

Division of Ser. No. 654,168, Feb. 2, 1976, Pat. No. 4,070,985. This application Jun. 13, 1977, Ser. No. 806,294

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1975, 2508990

Int. Cl.[2] B05D *1/00*

U.S. Cl. 427—209 **8 Claims**



1. A method of forming rows of spaced-apart split tile lengths into a hack for firing comprising the steps of:

moving palletized rows of unglazed, cut, spaced apart split tile lengths onto a first conveyor system,

moving the pallets on the first conveyor system to a first transfer position so as to form a transfer row of unglazed split tiles,

successively transferring a predetermined number of the transfer rows of unglazed split tiles from the transfer position onto a grouping area so as to form a number of such rows into a layer, and

transferring each layer thus formed onto a hack on a kiln car.

4,157,409

METHOD OF MAKING METAL IMPREGNATED GRAPHITE FIBERS

Albert P. Levitt, Newton Center, and Hans E. Band, Bedford, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 28, 1978, Ser. No. 937,387
Int. Cl.[2] C23C 1/00; B32B 15/14
U.S. Cl. 427—299 14 Claims

1. A process for fabricating graphite fiber reinforced metal comprising in sequence the steps of:

immersing a graphite fiber in a bath of liquid NaK alloy in an inert atmosphere for a period of time sufficient to enhance the wettability and infiltration of the graphite fiber, wherein the composition of the NaK alloy is such that the alloy is a liquid at room temperature,

transferring the fiber to, and immersing the fiber in, a molten bath of metal selected from the group consisting of aluminum, magnesium, copper, tin, lead, zinc and alloys thereof whereby the metal wets, infiltrates and coats the graphite fiber, and

removing the metal-coated fiber from the molten metal bath whereby upon cooling the metal hardens and a graphite fiber reinforced metal is fabricated.

4,157,410

COMPOSITE PRESSURE SENSITIVE ADHESIVE CONSTRUCTION

Jack M. McClintock, Stow, Ohio, assignor to Morgan Adhesives Company, Stow, Ohio

Filed Sep. 29, 1977, Ser. No. 837,828
Int. Cl.[2] A61F 13/02; E04F 13/20; B32B 7/02; C09J 7/02
U.S. Cl. 428—40 20 Claims

1. A composite pressure sensitive adhesive construction, comprising;

a first exterior release liner, a central release liner, and a second exterior release liner,

said first exterior release liner having a release coating, said central release liner having a release coating located on each side thereof, and said second exterior release liner having a release coating thereon,

a first pressure sensitive adhesive layer, said first pressure sensitive adhesive layer contacting said release coating located on said first exterior release liner and contacting a release coating located on one side of said central release liner and thereby releasably secured to said first exterior release liner and to said one side of said central release liner, and

a second pressure sensitive adhesive layer, said second pressure sensitive adhesive layer contacting said release coating located on said second exterior release layer and said release coating located on the remaining side of said central liner and thereby releasably secured to said second exterior release liner and to the remaining side of said central release liner.

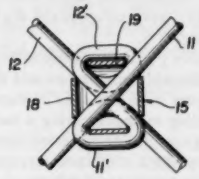
4,157,411

CONNECTOR ARRANGEMENT FOR CROSS-STRANDED NETTING

Walter G. Thomson, 8801 Shiro Rd., Hitchcock, Tex. 77563

Filed Mar. 14, 1978, Ser. No. 886,466
Int. Cl.[2] B21F 27/08; B32B 5/02
U.S. Cl. 428—107 2 Claims

1. A net structure comprising multiple substantially right angular crossing flexible net strands forming a rectangular net gridwork, formable sheet metal connectors for said strands at all of their crossing points, each connector being cruciform and including right angular arms which are arranged diagonally of the crossing strands and with the arms folded across said crossing points so as to clampingly embrace the strands at the crossing points on opposite faces of the net structure, the folded arms of said connectors being disposed symmetrically between adjacent right angular sections of the crossing net



strands and one net strand of each crossing pair pg,9 of strands being looped once about one of said folded arms and then continuing to pass diagonally through the connector, the strand loops thus formed being disposed on opposite sides of each connector to collectively form substantially a figure-8 loop configuration.

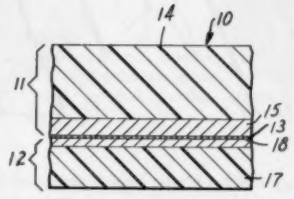
2. A net structure as defined in claim 1, and a settable adhesive mass enveloping the crossing point of each crossing pair of net strands within each formed sheet metal connector and bonding the strands to each other and to the connector.

4,157,412

COMPOSITE MATERIAL FOR AND METHOD FOR FORMING GRAPHICS

Kenneth S. Deneau, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 25, 1977, Ser. No. 844,600
Int. Cl.[2] B42B 31/26; B41M 5/26
U.S. Cl. 428—147 11 Claims



1. In a composite material for forming graphics such as letters, numbers, symbols or pictures in accordance with patterns of heating, the composite material comprising a donor web; a friable layer of granules releasably adhered to the donor web; and an accepting portion comprising a layer of latent adhesive material facing the layer of granules which adhesive material is nontacky at normal room temperature, but is selectively softened and activated when heated to a temperature range somewhat above normal room temperature and then adheres to granules so that upon separation of the accepting tape and donor web, the granules are carried to the accepting tape only in heated areas, the improvement wherein:

said composite material includes a soft conformable bonding material having a melting temperature below the softening temperature of said adhesive material, said bonding material being between and in face-to-face contact with the layer of granules and the layer of latent adhesive material to bond the layers together in close proximity and restrict air from entering therebetween during imagewise heating

and to ensure that the granules will not adhere to the adhesive in non-heated areas, while being absorbable or adsorbable by one of said layers to afford adhesion of the adhesive to the granules in the heated areas and being separable within itself or from one of said layers in the non-heated areas upon separation of the accepting portion and donor web.

7. A method of forming graphics such as letters, numbers, symbols or pictures comprising the steps of:

providing an accepting portion comprising a layer of latent adhesive material, which adhesive material is nontacky at normal room temperature, but is softened and activated when heated to a temperature range slightly above normal room temperature;

providing a transfer portion comprising a donor web, a layer of granules releasably adhered to said donor web;

bonding said layers in face-to-face contact with a soft conformable bonding material having a melting temperature below that of said latent adhesive material and of said granules to provide a composite material;

heating the composite material selectively in a graphic pattern above the softening range of said adhesive material so that the bonding material selectively melts in said pattern and is absorbed or absorbed by at least one of said layers and so that the layer of adhesive material selectively softens and adheres to the layer of granules; and

separating the accepting portion and donor web to carry granules to the accepting portion in the configuration of graphics corresponding to the pattern of heating.

4,157,413

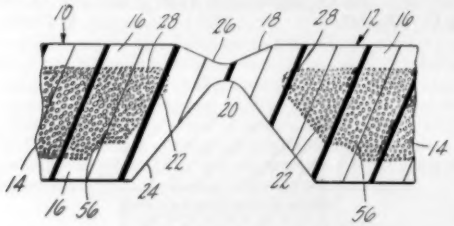
UNITARY PLASTIC HINGED ARTICLE AND METHOD OF MAKING

Edward A. Ruhl, Southfield, Mich., assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 759,256, Jan. 4, 1977, abandoned. This application Jul. 27, 1978, Ser. No. 928,573

Int. Cl.[2] B32B *3/30*

U.S. Cl. 428—159 **4 Claims**



1. A unitary molded plastic hinged article of homogenous composition in which sections are joined for angular swing relative to each other by a hinge structure formed integrally with said sections, at least one of said article sections being of substantial thickness and including a core of foamed thermoplastic polymeric material integrally formed with substantially unfoamed surface portions at opposed faces of said one article section and said hinge structure including a thin, unfoamed narrow flex portion and a transitional portion progressively increasing from the thickness dimension of said one article section, at least one surface of said transitional portion sloping from a level corresponding to a face of said one article section to a level corresponding to a surface of said flex portion, said transitional portion having substantially unfoamed surface portions integral with the unfoamed surface portions of said one article section and having an interior which is substantially unfoamed adjacent said flex portion and which is centrally foamed to a progressively greater thickness dimension approaching the thickness dimension of said foamed core at the juncture between said transitional portion and said one article section.

4,157,414

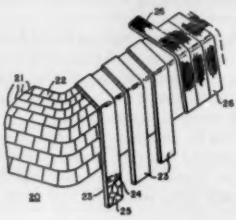
RESIN RICH POLYBUTADIENE-MICA FLEXIBLE HIGH VOLTAGE INSULATION

James D. B. Smith, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 26, 1977, Ser. No. 800,763

Int. Cl.[2] B32B *27/14, 25/02*

U.S. Cl. 428—283 **7 Claims**



1. A void free high voltage capability electrical pre-preg winding insulation tape, comprising mica, and a contacting polymerizable resinous composition consisting essentially of a homogeneous, substantially unreacted mixture of polybutadiene consisting of from about 20 weight percent to about 98 weight percent of 1,2-polybutadiene and from about 2 weight percent to about 80 weight percent of 1,4-polybutadiene; about 0.25 part to about 25 parts per 100 parts of total polybutadiene of a solid vinyl monomer coreactive with polybutadiene selected from the group consisting of vinyl carbazole, 1-vinyl naphthalene, 2-vinyl naphthalene, vinyl anthracene, N-vinyl phthalimide and mixtures thereof; up to about 5 weight percent of solvent for the polybutadiene and an amount of an organic reaction catalyst effective to cure the resinous mixture, at resin composition temperatures of at least about 130° C., said prepreg being dry and highly flexible, having a shelf life of at least 6 months.

4,157,415

LAMINATED PANEL CONSTRUCTION AND METHOD OF MAKING SAME

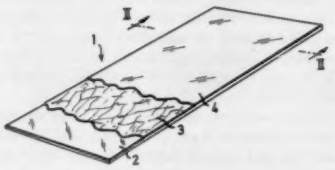
Hügo Lindenberg, Haus Hebborn, 5060 Bergisch Gladbach 2, Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 849,272

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 2650628; Nov. 5, 1976, 7635014[U]

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—284 **14 Claims**



1. A molded laminated panel construction comprising:

(a) a base panel of predetermined stable configuration and comprising a thermoplastic propylene-containing polymer and a filler, said filler comprising a cellulose-containing material,

(b) a non-woven expansible fabric mechanically anchored to and extending as a continuous unbroken layer over a surface of said base panel, said fabric being selected from the group consisting of synthetic and natural fibers,

(c) a thermoplastic foil having a surface thereof secured to said non-woven fabric by an adhesive material such that

said foil surface and non-woven fabric are maintained coextensive.

4,157,416

COMPOSITE FOAM STRUCTURE

A. Lawrence Cobb, Rochester, Mich., assignor to Composite Technology Corporation, Madison Heights, Mich.

Filed May 4, 1978, Ser. No. 902,590
Int. Cl.² B32B *3/26*
U.S. Cl. 428—311 **3 Claims**

2. A composite structure comprising a layer of initially resilient foam material having open and connected cells, said foam layer including transversely spaced outer surfaces, first and second layers of high strength filaments respectively overlaying said outer surfaces, an initially uncured, thermosetting polyester resin system impregnating the open cells of one portion of said foam layer, an initially uncured, thermosetting epoxy resin system impregnating the open cells of another portion of said foam layer, the thermosetting resin systems having been concurrently cured while maintaining the resilient foam layer and the high strength filaments under compression, the cured polyester resin system providing a first rigidified resin phase extending throughout its associated compressed foam layer portion and the cured epoxy resin system providing a second rigidified resin phase extending throughout its associated compressed foam layer portion, said polyester and epoxy resin systems coacting during polymerization to form a third rigidified resin phase along a boundary layer intermediate the first and second rigidified polymerized resins.

4,157,417

SOLAR CONTROL PRODUCTS

Charles H. Murphy, South Pasadena, Fla., assignor to ITD Industries Inc., St. Petersburg, Fla.

Continuation-in-part of Ser. No. 713,863, Aug. 12, 1976, abandoned. This application Aug. 16, 1978, Ser. No. 933,993
Int. Cl.² B32B *15/08, 17/10*
U.S. Cl. 428—344 **15 Claims**

1. In a thin, flexible transparent solar control sheet material adapted for use as a covering for transparent glass surfaces comprising an optically clear flexible polymeric film backing having on one surface a transparent reflective metal coating, the improvement which comprises, on that side of the sheet which bears the metal coating, a thin transparent aqueous activatable adhesive film composition comprising a major proportion of (a) an alkyl monoester of poly (methyl vinyl ether maleic acid) resin, and minor proportions of (b) at least one silane selected from the group consisting of beta-3,4 (epoxycyclohexyl) ethyltrimethoxysilane and gamma-glycidoxypropyltrimethoxysilane, (c) 2,4,7,9-tetramethyl-5-decyn-4, 7-diol, and (d) 4 dendro phenol, said 4 dendro phenol being present in an effective amount but insufficient to cause blocking when said sheets are packaged in rolls.

8. A coating composition for use in the production of solar control sheet materials, said coating composition comprising a major proportion of (a) an alkyl monoester of poly (methyl vinyl ether maleic acid) resin, and minor proportions of (b) at least one silane selected from the group consisting of beta-3,4 (epoxycyclohexyl) ethyltrimethoxysilane and gamma-glycidoxypropyltrimethoxysilane, (c) 2,4,7,9-tetramethyl-5-decyn-4,7-diol, and (d) 4 dendro phenol, said 4 dendro phenol being present in an effective amount but insufficient to cause blocking when said sheets are packaged in rolls.

11. In a thin, flexible transparent solar control sheet material adapted for use as a covering for transparent glass surfaces comprising an optically clear flexible polymeric film backing having on one surface a transparent reflective metal coating, the improvement which comprises, on that side of the sheet which bears the metal coating, a thin transparent aqueous activatable adhesive film composition comprising a major proportion of (a) an alkyl monoester of poly (methyl vinyl ether maleic acid) resin, and minor proportions of (b) at least one silane selected from the group consisting of beta-3,4 (epoxycyclohexyl) ethyltrimethoxysilane and gamma-glycidoxypropyltrimethoxysilane, (c) 2,4,7,9-tetramethyl-5-decyn-4, 7-diol, and (d) 4 dendro phenol, said 4 dendro phenol being present in an effective amount but insufficient to cause blocking when said sheets are packaged in rolls, and a thin film of a substrate which comprises a copolymer of acrylic acid or methacrylic acid or an ester of acrylic acid or methacrylic acid, said latter substrate being disposed between said metal coating and said thin transparent aqueous activatable adhesive film composition.

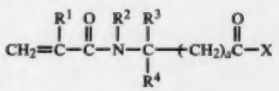
4,157,418

ACRYLIC FUNCTIONAL AMINOCARBOXYLIC ACIDS AND DERIVATIVES AS COMPONENTS OF PRESSURE SENSITIVE ADHESIVES

Steven M. Heilmann, North Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 8, 1978, Ser. No. 875,988
Int. Cl.² C09J *7/00, 7/02*
U.S. Cl. 428—355 **8 Claims**

1. In adhesive-coated sheet material comprising in combination a self-sustaining backing sheet having a layer of normally tacky and pressure sensitive adhesive bonded to at least one face thereof, the improvement which comprises using as adhesive a copolymer of monomers consisting essentially of (A) at least one or more monomeric acrylic acid esters of primary and/or secondary alcohol containing from 4 to 8 carbon atoms, and (B) less than 50 mole percent of at least one comonomer copolymerizable with said acrylic acid ester represented by the structural formula:



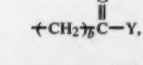
where

R^1 is H or methyl;

R^2 is H, alkyl of 1–4 carbon atoms or $-CH_2CH_2CN$;

R^3 is H or alkyl of 1–4 carbon atoms;

R^4 is H, alkyl of 1–4 carbon atoms, $-CH_2C_6H_5$, $+CH_2\frac{}{2}SCH_3$, and



where b is 1 or 2 and Y is $-NH_2$ or $-OH$;

a is 0, 1, 2 or 3;

X is Y and R^2 and R^3 taken together can be $(CH_2)_3$.

4,157,419

POLYESTER FEED YARN FOR DRAW-TEXTURING

Michael E. Mirhej, Signal Mountain, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 16, 1977, Ser. No. 833,911
Int. Cl.² D02G *3/00*
U.S. Cl. 428—373 **8 Claims**

1. A polyester feed yarn for drawtexturing, having an elon-

gation at break of about 30 to 150 percent, of filaments having deniers within the range of 2 to 8, and comprising the following types of filaments:

(A) 20 to 40 percent (based on the total number of filaments) of filaments consisting of a polymer of about 97 to 100 mole percent ethylene terephthalate structural units and about 3 to 0 mole percent of polymer structural units which contain sulfonate groups as pendant parts of repeating units in the polymer chain,

(B) 20 to 40 percent (based on the total number of filaments) of filaments consisting of a polymer of about 85 to 95 mole percent ethylene terephthalate structural units and about 15 to 5 mole percent of other ester units forming a copolyester therewith, and

(C) 15 to 35 weight percent (based on the total weight of the yarn) of eccentric bicomponent filaments wherein 20 to 80 percent of this filament cross section consists of a component having the same composition as type (A) and the remainder of the cross section consists of a component having the same composition as type (B); the bicomponent filaments having an average denier smaller than any of the other filaments, an elongation at break averaging less than 80 percent of the break elongation of any of the other filaments, and the property of forming helical crimp when the filaments are hot drawn and broken.

4,157,420

ADHESIVE-COATING GLASS FIBERS AND THE RESULTING COATED FIBERS

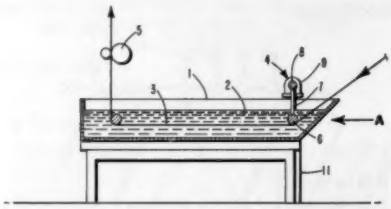
Paul Bourrain, Ecully, and Pierre Giroud, La Verpillere, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Filed Aug. 2, 1977, Ser. No. 821,175

Claims priority, application France, Aug. 4, 1976, 76 24021

Int. Cl.[2] B23B *9/00*; D02G *3/00*

U.S. Cl. 428—392 **4 Claims**



1. A process for adhesive-coating glass fibers, characterised in that the glass fibers are impregnated by means of a composition consisting essentially of a solution A produced from:

softened water	433 parts by weight
resorcinol	36.6 parts by weight
sodium hydroxide	1 to 3.50 parts by weight
40% strength formaldehyde	21.3 to 50.0 parts by weight

and a latex solution B consisting essentially of:

softened water	0 to 292 parts by weight
60% strength natural latex	213 to 428 parts by weight
40% strength latex based on vinylpyridine	640 to 960 parts by weight

in which:

the total weight of solids relative to the bath varies between about 30 and 35%;

the formaldehyde/resorcinol molar ratio varies between 0.85 and 2;

the dry weight of latex relative to the resorcinol/formaldehyde resin varies between about 8.5/1 and 11/1;

the final pH is 9.6±0.2; and

the proportion by weight of dry resorcinol/formaldehyde resin relative to the amount of all the products varies between 10 and 12%

and in that the fibers passing through the bath are subjected to vibratory movements communicated directly to the fibers.

4,157,421

PHOTOCURABLE COMPOSITIONS COMPRISING A POLYTHIOL AND A POLYENE DERIVED FROM A VINYL ACETAL

Claude J. Schmidle, and Robert Barclay, Jr., both of Trenton, N.J., assignors to Thiokol Corporation, Newtown, Pa.

Filed Sep. 7, 1976, Ser. No. 720,531

Int. Cl.[2] B05D *3/06*; C08F *2/48*

U.S. Cl. 428—419 **3 Claims**

1. A film suitable for coating a substrate which comprises a cured film formed by treating with actinic radiation a lamina comprising a polythiol and a polyene derived from a vinyl acetal.

4,157,422

ALUMINOUS METAL SHEET

Robert J. Sturwold; Walter E. Utz, both of Cincinnati, Ohio; Nicholas Christ, Richmond, Va.; William R. Ford, Jr., Richmond, Va., and George P. Koch, Richmond, Va., assignors to Emery Industries, Inc., Cincinnati, Ohio and Reynolds Metals Co., Richmond, Va.

Division of Ser. No. 832,258, Sep. 12, 1977, Pat. No. 4,122,217, which is a continuation of Ser. No. 602,816, Aug. 7, 1975, abandoned. This application Jul. 10, 1978, Ser. No. 922,912

Int. Cl.[2] C21D *1/00*

U.S. Cl. 428—457 **7 Claims**

1. Aluminous metal sheet resistant to the formation of water stain having applied thereon a continuous film of at least 0.5 milligram per square foot of a protective composition having a hydroxyl value greater than 15 and consisting essentially of

(a) an aliphatic or cycloaliphatic polybasic acid containing from 18 to 72 carbon atoms and 2 to 4 carboxyl groups, and

(b) a partial ester of a polyol derived from a C_{12}–C_{22} aliphatic monocarboxylic acid and a polyol containing 3 to 30 carbon atoms and 3 to 22 hydroxyl groups, blended or reacted at a weight ratio (a):(b) ranging from 20:1 to 1:4.

4,157,423

BATTERY CONTAINING AN ALKALINE ELECTROLYTE

Robert Gadessaud, Massy, France, assignor to Compagnie Generale d'Electricite, Paris, France

Continuation of Ser. No. 316,199, Dec. 18, 1972, Pat. No. 4,086,405. This application Oct. 18, 1977, Ser. No. 843,105

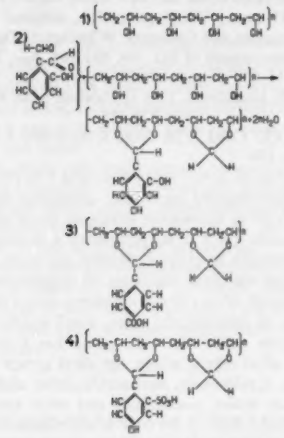
Claims priority, application France, Dec. 16, 1971, 71.45268; Feb. 18, 1972, 72.05561; Aug. 4, 1972, 72.28255; Aug. 8, 1972, 72.28595; Aug. 10, 1972, 72 28943; Aug. 10, 1972, 72.28944

Int. Cl.[2] H01M *2/14*

U.S. Cl. 429—206 **9 Claims**

1. An alkaline battery having a zinc electrode or cadmium-nickel electrodes, said battery containing within a container an electrolyte, a negative electrode and a positive electrode separated by a separator consisting of a membrane permeable to said electrolyte and impermeable to the ions emitted by said negative electrode and also to gaseous oxygen, thus creating two compartments communicating solely by way of this membrane, said battery being characterized in that the separator comprises a partially reticulated polyvinyl acetal produced by the acetalization action of dimethylolurea on polyvinyl alcohol

and wherein the separator has been subjected to a thermal treatment to terminate the acetalyzation process and to create



ether oxide links between polymer chains and the partially reticulated polyvinyl acetal.

4,157,424
PRODUCTION OF POROUS MATERIALS

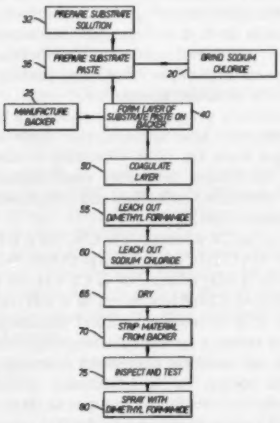
David L. Boutle, Maldon, England, assignor to Porvair Limited, Norfolk, England

Continuation-in-part of Ser. No. 479,337, Aug. 12, 1965, abandoned, and a continuation-in-part of Ser. No. 697,164, Jan. 11, 1968, abandoned, and a continuation of Ser. No. 14,710, Feb. 9, 1970, abandoned, and a continuation-in-part of Ser. No. 697,154, Jan. 11, 1968, abandoned, and a continuation of Ser. No. 90,192, Oct. 2, 1970, Pat. No. 3,729,538, said Ser. No. 14,710, is a continuation of Ser. No. 697,164, , which is a continuation of Ser. No. 697,154,. This application Nov. 23, 1971, Ser. No. 201,295

Claims priority, application United Kingdom, Aug. 13, 1964, 33047/64

Int. Cl.[2] B29D *27/04*

U.S. Cl. 521—61 **27 Claims**



1. A method of making a microporous polymeric plastics material which comprises

(a) forming a mixture comprising a solution of elastomeric polyurethane in water-miscible organic solvent, the said solution having evenly distributed through its microscopic particles of water-soluble inorganic salt,

(b) shaping the mixture into a layer, and

(c) solidifying said polyurethane by the action of aqueous non-solvent therefor, which is miscible with the organic solvent, and leaching out said microscopic particles of the salt to leave the elastomeric polyurethane in a microporous solid form, as a layer, the weight ratio of salt to polyurethane being up to about 6:1.

9. Product of the process of claim 1.

4,157,425
CATALYTIC PROCESS FOR THE PREPARATION OF PHOSPHAZENE POLYMERS

Ronald L. Dieck, and Alan B. Magnusson, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 731,745, Oct. 12, 1976. This application Apr. 10, 1978, Ser. No. 895,260

Int. Cl.[2] C08J *9/06*

U.S. Cl. 521—95 **8 Claims**

1. A process for producing a phosphazene polymer foam which comprises:

(a) thermally polymerizing a cyclic compound of the formula $(NPCl_2)_y$ wherein y is 3, 4, or mixtures thereof with a catalytically sufficient amount of a compound having the formula $M(OR')_x$, wherein M is an alkali metal or an alkaline earth metal, x is equal to the valence of the metal M, and R′ is C_1 to C_{10} linear or branched alkyl, C_1 to C_{10} substituted linear or branched alkyl, the substituent selected from the group consisting of nitro, C_1 to C_{10} alkyl, C_1 to C_{10} alkoxy, C_6 to C_{10} aryl and C_6 to C_{10} aryloxy radicals to form a phosphazene polymer;

(b) contacting the resulting phosphazene polymer with a metal compound having the formula

$M(OC_6H_4R_1)_x$,

$M(OC_6H_4R_2)_x$, or mixtures thereof

wherein M is an alkali metal or alkaline earth metal, x is equal to the valence of said metal M, and R_1 and R_2 are the same or different and are selected from the group consisting of C_1 to C_{10} alkyl radical, C_6 to C_{10} aryl radical, C_1 to C_{10} substituted C_1 to C_{10} alkyl radical and substituted C_6 to C_{10} aryl radical, the substituent selected from the group consisting of halogen, nitro, cyano, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, C_6 to C_{10} aryl and C_6 to C_{10} aryloxy radicals, thereby forming a phosphazene polymer which is substantially free of halogen; and

(c) mixing the resulting phosphazene polymer which is substantially free of halogen with a chemical blowing agent and heating the resulting mixture to a temperature sufficient to decompose said blowing agent and form a foam.

4,157,426
SILICONE RUBBER COMPOSITIONS

Masayuki Hatanaka, Gunma; Makoto Matsumoto, Ashikaga, and Masaharu Yonezawa, Oota, all of Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 743,234, Nov. 18, 1976, Pat. No. 4,108,833. This application May 4, 1978, Ser. No. 902,897

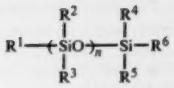
Claims priority, application Japan, Dec. 24, 1975, 51/155352

Int. Cl.[2] C08J *9/00*

U.S. Cl. 521—122 **11 Claims**

1. A foamable silicone rubber composition consisting essentially of

(A) 100 parts by weight of diorganopolysiloxane having the formula



wherein R^1, R^2, R^3, R^4, R^5 and R^6, which can be the same or different, are organo groups selected from the group consisting of methyl, vinyl and phenyl, with the provisos that from 0.01 to 2.0 mole percent of said organo groups are vinyl and there are at least two vinyl groups in the molecule, from zero to 10 mole percent of said organo groups are phenyl, and the balance of said organo groups are methyl, the average number of said organo groups being from 1.98 to 2.02, per one silicone atom, and n is a number from 50 to 10000 on the average.

(B) from 0.1 to 100 parts by weight of organohydrogenpolysiloxane having at least two Si-H bonds in the molecule,

(C) from 0.0001 to 0.2 parts by weight of (O) valent platinum-(III)phosphor complex, and

(D) from 10 to 200 parts by weight of wet-process silica previously treated to make it hydrophobic.

4,157,427

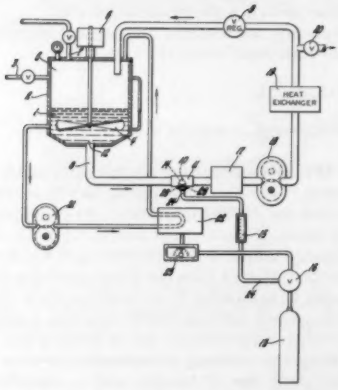
METHOD FOR ENTRAINING GAS IN A LIQUID CHEMICAL PRECURSOR FOR REACTION INJECTION MOLDING

George Ferber, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 11, 1977, Ser. No. 840,904

Int. Cl.[2] C08J *9/30*

U.S. Cl. 521—133 **4 Claims**



1. A method of rapidly entraining a predetermined quantity of a gas into a liquid constituent which is intended subsequently to be mixed with a second constituent reactive therewith to form a cellular polyurethane body, said method comprising the steps of

containing said liquid constituent in a stirred vessel, said vessel being equipped with a recirculation line leading away from and returning to said vessel,

withdrawing a relatively small portion of said liquid constituent from said vessel through said line,

entraining minute bubbles of a gas in said portion of said liquid constituent, said bubbles emanating from a rigid microporous structure positioned in the line and in the path of the flowing constituent,

returning said portion of said liquid constituent containing the entrained bubbles through said line to said stirred vessel,

repeating said withdrawing, entraining and returning steps until a desired amount of said gas is entrained in the liquid constituent.

4,157,428

ETHYLENE CARBON MONOXIDE COPOLYMERS CONTAINING EPOXY SIDE GROUPS

Clarence F. Hammer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 681,741, Apr. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 580,515, May 23, 1975, abandoned. This application Mar. 4, 1977, Ser. No. 774,435

Int. Cl.[2] C08J *5/18, 5/00, 9/00;* C08G *8/28*

U.S. Cl. 521—134 **62 Claims**

1. Curable blends comprising by weight 1 to 99 percent of a free radical polymerized copolymer consisting essentially of, by weight (a) 40 to 90 percent ethylene; (b) 0 to 20 percent carbon monoxide; (c) 5 to 40 percent of a monomer copolymerizable therewith to provide flexible polymers, said monomer taken from the class consisting of unsaturated mono- or dicarboxylic acids of 3 to 20 carbon atoms, esters of said unsaturated mono- or dicarboxylic acids, vinyl esters of saturated carboxylic acids where the acid group has 1 to 18 carbon atoms, vinyl alkyl ethers where the alkyl group has 1 to 18 carbon atoms, acrylonitrile, methacrylonitrile, alpha-olefins of 3 to 20 carbon atoms, norbornene and vinyl aromatic compounds, and (d) 0.2 to 15 percent of an ethylenically unsaturated monomer of 4 to 21 carbon atoms containing an epoxy group; and 1 to 99 percent of an organic thermosetting resin with which said copolymer is only functionally compatible, said resin being selected from the group consisting of phenolic resins, epoxy resins, and melamine formaldehyde resins.

4,157,429

AMINE TERMINATED POLYMERS AND THE FORMATION OF BLOCK COPOLYMERS

William L. Hergenrother; Richard A. Schwarz, both of Akron; Richard J. Ambrose, Fairlawn, and Robert A. Hayes, Cuyahoga Falls, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 574,676, May 5, 1975, Pat. No. 4,070,344. This application Apr. 29, 1977, Ser. No. 792,283

Int. Cl.[2] C08J *9/10;* C08L *77/06*

U.S. Cl. 521—137 **10 Claims**

1. A nylon block copolymer composition, comprising;

an amine terminated polymer connected to a nylon polymer constituent to form the block copolymer,

said amine terminated polymer formed by the reaction of an anionically prepared polymer and a compound selected from the class consisting of polyisocyanates or polyisothiocyanates so that at least one unreacted isocyanate or isothiocyanate end portion exists wherein said unreacted isocyanate or isothiocyanate end portion has been converted to an amine group,

said anionically prepared polymer being a homopolymer or a copolymer, said homopolymer made from monomers selected from the class consisting of conjugated diene, vinyl substituted aromatic, vinyl substituted pyridine, vinyl substituted quinoline, and compounds selected from the class consisting of

1. $CH_2{=}CACN$ wherein A is CN, CF_3, CH_3 or H;
2. $CH_2{=}CACO_2R$ wherein A is CO_2R, SO_2R, CH_3 or H;
3. $CH_2{=}CANO_2$ wherein A is Cl, CH_3 or H;
4. $CH_2{=}CACON(R)_2$ wherein A is CH_3 or H;

wherein R is hydrogen, an alkyl containing from 1 to 15 carbon atoms, a cycloalkyl containing from 4 to 15 carbon atoms, an aromatic compound containing from 6 to 15 carbon atoms, or a substituted aromatic compound wherein said substituted group is an alkyl containing from 1 to 15 carbon atoms or a cycloalkyl containing from 4 to 15 carbon atoms,

said copolymer made from monomers of conjugated dienes and vinyl substituted aromatics,

said amine terminated polymer having a molecular weight of from about 3,000 to about 100,000,

said polyisocyanates and said polyisothiocyanates having the formula

$$R{-}N{=}C{=}X)_n$$

wherein R is an aliphatic containing from 2 to about 20 carbon atoms, a cycloaliphatic containing from 4 to about 20 carbon atoms, an aromatic containing from 6 to about 20 carbon atoms, and combinations thereof, n is an integer of 2 or 3 and X is selected from the class consisting of oxygen and sulfur,

said nylon constituent made from monomers selected from the class consisting of (a) anionically polymerizable lactams having from 3 to 15 carbon atoms, (b) diacid chlorides reacted with diamines, and (c) diacids reacted with diamines so that salts thereof are formed,

the amount of said nylon polymer ranging from about 5 percent to about 95 percent by weight based upon the total weight of said block copolymer, and the molecular weight of said nylon polymer ranging from about 5,000 to about 50,000.

4,157,430
AMINE TERMINATED POLYMERS AND THE FORMATION OF BLOCK COPOLYMERS

William L. Hergenrother; Richard A. Schwarz, both of Akron; Richard J. Ambrose, Fairlawn, and Robert A. Hayes, Cuyahoga Falls, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 574,676, May 5, 1975, Pat. No. 4,070,344. This application Apr. 29, 1977, Ser. No. 792,284

Int. Cl.[2] **C08J** *9/10;* **C08L** *77/06*

U.S. Cl. 521—137 **11 Claims**

1. A process for producing a nylon block copolymer, comprising the steps of;

anionically polymerizing monomers to form a polymer, said polymer being a homopolymer or a copolymer, said homopolymer made from monomers selected from the class consisting of conjugated diene, vinyl substituted aromatic, vinyl substituted pyridine, vinyl substituted quinoline, and compounds selected from the class consisting of

1. $CH_2{=}CACN$ wherein A is CN, CF_3, CH_3 or H;
2. $CH_2{=}CACO_2R$ wherein A is CO_2R, SO_2R, CH_3 or H;
3. $CH_2{=}CANO_2$ wherein A is Cl, CH_3 or H;
4. $CH_2{=}CACON(R)_2$ wherein A is CH_3 or H;

wherein

R is a hydrogen, an alkyl containing from 1 to 15 carbon atoms, a cycloalkyl containing from 4 to 15 carbon atoms, an aromatic compound containing from 6 to 15 carbon atoms, or a substituted aromatic compound wherein said substituted group is an alkyl containing from 1 to 15 carbon atoms or a cycloalkyl containing from 4 to 15 carbon atoms,

said copolymer made from monomers of conjugated dienes and vinyl substituted aromatics,

the molecular weight of said amine terminated polymer ranging from about 3,000 to about 100,000 and the molecular weight of said nylon block copolymer ranging from about 5,000 to about 50,000,

reacting said anionically prepared polymer with a compound selected from the class consisting of polyisocyanates or polyisothiocyanates to form an end capped polymer, said polyisocyanates or said polyisothiocyanates having the formula

$$R{-}N{=}C{=}X)_n$$

wherein

R is an aliphatic containing from 2 to about 20 carbon atoms, a cycloaliphatic containing from 4 to 20 carbon atoms, an aromatic containing from 6 to 20 carbon atoms, and combinations thereof, n is an integer of 2 or 3 and X is selected from the class consisting of oxygen and sulfur,

reacting an amide compound with said end capped polymer to form an amide type terminated polymer,

hydrolyzing said imide terminated polymer to produce an amine terminated polymer,

reacting said amine terminated polymer with a compound selected from the class consisting of a (a) nylon polymer made from nylon forming monomers so that a nylon block copolymer is formed wherein said nylon polymer is connected to said amine terminated polymer, (b) a nylon prepolymer made from nylon forming monomers, and (c) nylon forming monomers, and

polymerizing in the presence of said amine terminated polymer said compound selected from the class consisting of said (b) nylon prepolymer made from nylon forming monomers, and (c) said nylon forming monomers to form a nylon polymer so that a nylon block copolymer is formed wherein said nylon polymer is connected to said amine terminated polymer,

said nylon forming monomers selected from the class consisting of (a) anionically polymerizable lactams having from 3 to 15 carbon atoms, (b) diacid chlorides reacted with diamines, and (c) diacids reacted with diamines so that salts thereof are formed,

said nylon polymer constituent of said block copolymer ranging from about 5 percent to about 90 percent by weight, and

the molecular weight of said nylon polymer ranging from about 5,000 to about 50,000.

4,157,431
SEPARATION OF BLOOD COAGULATION FACTORS WITH NON-ACTIVATING POLYELECTROLYTES

Joseph E. Fields, Ballwin, and Robert J. Slocombe, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 818,918, Jul. 25, 1977, abandoned. This application Aug. 15, 1978, Ser. No. 933,698

Int. Cl.[2] **C08F** *8/32;* **C07G** *7/00*

U.S. Cl. 526—15 **22 Claims**

1. A method for separating specific blood coagulation factor from admixture with other blood proteins in a fluid medium comprising the step of contacting said medium with a water-insoluble, cross-linked polyelectrolyte copolymer of (a) unsaturated monomer having from 2 to about 18 carbon atoms and (b) a monomer selected from the group consisting of unsaturated polycarboxylic acid or anhydride having from about 4 to about 12 carbon atoms which is partially substituted at its free carboxyl or anhydride sites with amine-imides and which is further characterized in that substantially all the remaining free carboxyl or anhydride sites are blocked with alkoxyalkylamine, to thereby selectively adsorb said specific coagulation factor to the substantial exclusion of said other blood proteins without producing any substantial preactivation of said specific coagulation factor.

9. In the method of making a water-insoluble, cross-linked polyelectrolyte of the type suitable for the factionation of blood components and comprising a copolymer of (a) unsaturated monomer having from 2 to about 18 carbon atoms and (b) a monomer selected from the group consisting of unsaturated polycarboxylic acid or anhydride having from about 4 to about 12 carbon atoms which is partially substituted at its free carboxyl or anhydride sites with amine-imides, the improvement comprising blocking substantially all the remaining free carboxyl or anhydride sites with alkoxyalkylamine whereby said polyelectrolyte can be used for the separation of specific blood coagulation factor from other blood proteins in a fluid medium without thereby causing any substantial preactivation of said specific coagulation factor.

16. A water-insoluble, cross-linked polyelectrolyte of the type suitable for the fractionation of blood components comprising a copolymer of (a) unsaturated monomer having from 2 to about 18 carbon atoms and (b) a monomer selected from the group consisting of unsaturated polycarboxylic acid or anhydride having from about 4 to about 12 carbon atoms

which is partially substituted at its free carboxyl or anhydride sites with amine-imides, and which is further characterized in that substantially all the remaining free carboxyl or anhydride sites are blocked with alkoxyalkylamine whereby said polyelectrolyte can be used for the separation of specific blood coagulation factor from other blood proteins in a fluid medium without thereby causing any substantial pre-activation of said specific coagulation factor.

4,157,432

BULK SULFONATION PROCESS

Robert D. Lundberg, Bridgewater; Henry S. Makowski, Scotch Plains, both of N.J.; Jan Bock, Houston, Tex., and Thomas Zawadski, Plainsboro, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 29, 1977, Ser. No. 855,692

Int. Cl.[2] C08F *8/34*; C08C *19/20*

U.S. Cl. 526—31 **24 Claims**

1. A process for the bulk sulfonation of hydrocarbon polymers, characterized before sulfonation, by the presence in said polymers of sulfonatable sites selected from the group consisting of olefinic unsaturation and arylene radicals, which comprises:

(a) mechanically mixing said polymers or mixtures of hydrocarbon polymers comprising said polymers with a sulfonation reagent comprising sulfuric acid or sulfur trioxide or both, in the substantial absence of a solvent for said polymers at a temperature which is between the glass transition temperature and 250° C. for amorphous polymers and between the crystalline melting point and 250° C. for crystalline or semicrystalline polymers for a time sufficient to effect sulfonation; followed by

(b) recovering said sulfonated polymers and said mixtures.

4,157,433

CATHODE MATERIALS

Gary M. Phillips, West St. Paul, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed May 1, 1978, Ser. No. 901,506

Int. Cl.[2] C08F *8/22*

U.S. Cl. 526—43 **15 Claims**

1. A method of preparing a cathode material is improved conductivity comprising the steps of mixing a quantity of polymeric material selected from the group consisting of P2VP, P4VP and mixtures thereof with a quantity of iodine sealing the mixture in a sealed container and heating the mixture to a temperature of at least about 225° C. for a predetermined period of time.

4,157,434

PROCESS FOR REMOVING METAL-EDTA COMPLEX AND FREE EDTA SALTS FROM MIXED AQUEOUS-ORGANIC MEDIA

Daniel E. Floryan, Glenmont, N.Y., and Daniel W. Fox, Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 30, 1977, Ser. No. 866,010

Int. Cl.[2] C08G *65/46*

U.S. Cl. 526—71 **11 Claims**

1. A process for removing a metal-ethylenediamine tetraacetic acid complex alone or together with an unchelated salt of ethylenediamine tetraacetic acid from solution in a mixture comprising a solvent for a polyphenylene ether resin, an antisolvent for said resin and water, the process comprising:

(a) contacting said mixture with at least an effective amount of alumina for a time at least sufficient to selectively adsorb substantially all of said metal-ethylenediamine tetraacetic acid complex and unchelated salt of ethylenediamine tetraacetic acid, and

(b) recovering a mixture comprising said solvent for said polyphenylene ether resin, said antisolvent and said water substantially free of said metal-ethylenediamine tetraacetic acid complex and unchelated salt of ethylenediamine tetraacetic acid.

4,157,435

PROCESS FOR PREPARING HIGHLY STEREOREGULAR POLYOLEFINS AND CATALYST USED THEREFOR

Akinori Toyota, Ohtake; Norio Kashiwa, Iwakuni, and Syuji Minami, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 545,874, Jan. 31, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,658

Claims priority, application Japan, Aug. 10, 1974, 49-91181

Int. Cl.[2] C08F *4/02, 10/06*

U.S. Cl. 526—125 **27 Claims**

1. A process for preparing highly stereoregular polyolefins, which comprises polymerizing or copolymerizing α-olefins having at least 3 carbon atoms in the presence of a catalyst, said catalyst comprising

(A) a titanium-containing solid catalyst component composed of an organic complex derived from

(i) a magnesium dihalide,

(ii) an organo polysiloxane selected from at least one of the group consisting of:

compounds of the formula

$$Q(Q_2SiO)_nSiQ_3$$

wherein Q's are identical or different, and represent a moiety selected from the group consisting of hydrogen, alkyl, cycloalkyl and aryl, with the proviso that all Q moieties are not hydrogen at the same time, and n is an integer of 1 to 1000;

compounds of the formula

$$(Q_2SiO)_n$$

wherein Q is the same as defined above, and n is an integer of 2 to 1000; and

compounds of the formula

$$X(Q_2SiO)_nSiQ_2X$$

wherein Q is the same as defined above, n is an integer of 1 to 1000, and X is halogen,

(iii) an organic carboxylic acid ester, and

(iv) a titanium compound of the formula

$$Ti(OR)_lX_{4-l}$$

wherein R is a moiety selected from the group consisting of alkyl groups and a phenyl group optionally substituted with an alkyl group with 1 to 4 carbon atoms, X is a halogen, and l is 0 or an integer of 1 to 4,

and

(B) at least one organoaluminum catalyst component of the formula

$$R'_mAl(OR')_{3-m}$$

wherein R' moieties are identical or different, and represent alkyl, and m is a positive number of 1.5 to 3,

said organic complex being derived by bringing the component (i) into contact with a combination of the components (ii) and (iii) in a molar ratio (i)/(ii)/(iii) of 1/1000–0.01/10–0.005 or a combination of the components (ii), (iii) and (iv) in a molar ratio (i)/(ii)/(iii)/(iv) of 1/1000–0.01/10–0.005/100–0.001 under mechanical pulverization conditions and then, as an additional step, treating the resulting pulverized composition with the component (iv) in the absence of mechanical pulverization.

4,157,436

PHOSPHORUS-CONTAINING POLYESTERS

Seiji Endo; Takao Kashihara; Akitada Osako; Tatsuhiko Shizuki, and Tadashi Ikegami, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

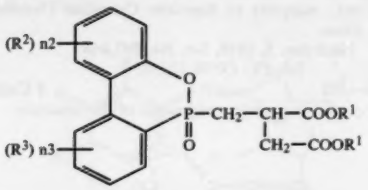
Division of Ser. No. 730,512, Oct. 7, 1976. This application Dec. 9, 1977, Ser. No. 859,104

Claims priority, application Japan, Oct. 14, 1975, 50/124164; Jan. 23, 1976, 51/6924; Feb. 13, 1976, 51/15088; Feb. 13, 1976, 51/15090

Int. Cl.[2] C08G *63/66, 63/68*

U.S. Cl. 528—167 3 Claims

1. A flame retardant polyester having a phosphorus atom content of 500–50,000 ppm containing a flame-retarding amount of a phosphorus containing compound represented by the following general formula (I):



(I)

wherein each of R^1 is a hydrogen atom or hydrocarbon group having 1–10 carbon atoms which may contain a hydroxyl group, and both R^1's may together form a dehydrated ring when both of R^1's represent hydrogen atoms, each of R^2 and R^3 is a member selected from the group consisting of halogen atoms and hydrocarbon groups having 1–10 carbon atoms, and each of n2 and n3 is an integer of 0–4.

4,157,437

ADDITION COPOLYMERS OF LACTIDE AND GLYCOLIDE AND METHOD OF PREPARATION

Yuzi Okuzumi, Belle Mead; A. Darline Mellon, Bridgewater, and David Wasserman, Springfield, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 809,737, Jun. 24, 1977. This application Jun. 12, 1978, Ser. No. 914,692

Int. Cl.[2] C08G *63/08*

U.S. Cl. 528—354 13 Claims

1. A method for preparing a crystalline copolymer of lactide and glycolide containing from 50 to 75 wt percent glycolide which comprises:

a. preparing a random copolymer comprising a major portion of an optically active lactide and a minor portion of a monomer selected from the group consisting of glycolide and d,l-lactide, and

b. admixing with said random copolymer additional monomers comprising from 70 to 90 wt percent glycolide and 10 to 30 wt percent of an optically active lactide, the quantity of glycolide being sufficient to provide from 50 to 75 wt percent glycolide in the polymer-monomer mixture, and

c. polymerizing said polymer-monomer mixture to obtain said crystalline copolymer of lactide and glycolide,

said copolymer having an inherent viscosity determined as a 0.1% solution in hexafluoroisopropanol at 25° C. of at least about 1.20, a melting point of at least about 160° C. and a crystallinity of at least about 15%.

4,157,438

PROCESS FOR THE PRODUCTION OF POLY(AMINE ALLYL HALIDE) COPOLYMER AND THEIR REACTION PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 757,239, Jan. 6, 1977, Pat. No. 4,069,391, which is a continuation-in-part of Ser. No. 622,525, Oct. 15, 1975, Pat. No. 4,020,259. This application Dec. 19, 1977, Ser. No. 862,020

Int. Cl.[2] C08G *61/12, 65/24, 85/00, 77/00*

U.S. Cl. 528—392 7 Claims

1. The process for the production of poly(allylhalide amine) copolymer by the following steps:

(a) admixing an allyl halide and an amine compound in the ratio of 1 mol of the amine to 0.5 to 6 mols of the allyl halide with an oxidated silicon compound in the ratio of 1 part by weight of the oxidated silicon compound to 1 to 3 parts by weight of the allyl halide;

(b) agitating said mixture for 10 to 60 minutes as a temperature between ambient temperature and the boiling point of the reactants, thereby

(c) producing a poly(allylhalide amine) copolymer.

4,157,439

NOVEL NITROSOUREA DERIVATIVES

Tetsuo Suami, 5-8, Nakacho 3-chome, Musashino-shi, Tokyo, Japan

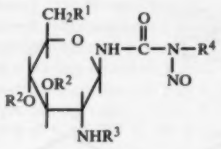
Filed Aug. 26, 1977, Ser. No. 828,099

Claims priority, application Japan, Sep. 2, 1976, 51-104300

Int. Cl.[2] C07H *19/00;* A61K *31/70*

U.S. Cl. 536—22 8 Claims

1. Nitrosourea derivative of the formula:



(I)

wherein R^1 represents a hydroxyl or an alkanoyloxy containing 2–4 carbon atoms; R^2 represents a hydrogen or an alkanoyl containing 2–4 carbon atoms; R^3 represents an alkanoyl containing 2–4 carbon atoms; and R^4 represents a halo-substituted alkyl containing 1–4 carbon atoms.

4,157,440

THERAPEUTICALLY ACTIVE D-GLUCOSAMINE SALTS

Alberto Reiner, Como, and Giacinto Rossi, Banchette, both of Italy, assignors to Marxer S.p.A., Twin, Italy

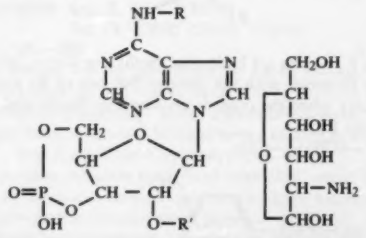
Filed Mar. 20, 1975, Ser. No. 560,236

Claims priority, application Italy, Apr. 2, 1974, 49967 A/74

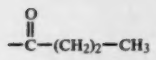
Int. Cl.[2] C07H *19/20*

U.S. Cl. 536—27 5 Claims

1. d-glucosamine salts having the general formula:



wherein R and R_1 are a hydrogen atom or



4,157,441

7,8-DIDEHYDRO-2-DECARBOXY-2-HYDROXYMETHYL-PGI$_1$ COMPOUNDS

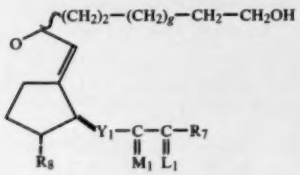
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 869,141, Jan. 13, 1978. This application Jul. 3, 1978, Ser. No. 921,631

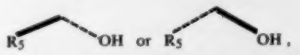
Int. Cl.^{2} C07D *307/93*

U.S. Cl. 542—426 **57 Claims**

1. A prostacyclin analog of the formula

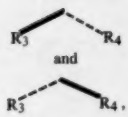


wherein g is the integer one, 2, or 3;
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;
wherein Y_1 is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —CH_2CH_2—, or
(4) C≡C—;
wherein M_1 is

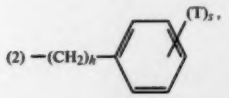


wherein R_5 is hydrogen or methyl;
wherein L_1 is

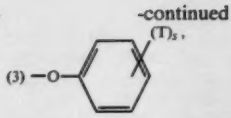
or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein R_7 is
(1) —$(CH_2)_m$—CH_3,



-continued



wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl.

4,157,442

PROCESS FOR PREPARATION OF 2-VINYLTETRAHYDROPYRIMIDINES

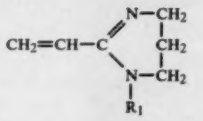
Hans P. Panzer, Stamford, and Kenny U. Acholonu, Bridgeport, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 5, 1978, Ser. No. 867,065

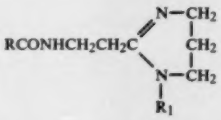
Int. Cl.^{2} C07D *233/06*

U.S. Cl. 544—242 **5 Claims**

1. A process for preparing compounds of the structure



wherein R_1 is hydrogen or an alkyl group of about 1 to 5 carbon atoms, said process comprising heating to cracking temperature a compound of the structure



wherein R is an alkyl group of about 1 to 5 carbon atoms and R_1 is hydrogen or an alkyl group of about 1 to 5 carbon atoms, distilling the cleavage products, and recovering the desired compound from the distillate.

4,157,443

V-TRIAZOLYL-[4,5-d]-PYRIMIDINES

Ian J. Fletcher, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

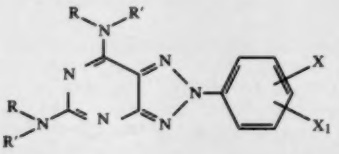
Filed Oct. 31, 1977, Ser. No. 846,875

Claims priority, application Luxembourg, Nov. 11, 1976, 76169; Switzerland, Jul. 11, 1977, 8523/77

Int. Cl.^{2} C07D *487/04*

U.S. Cl. 544—254 **5 Claims**

1. A v-triazolyl[4,5-d]pyrimidine of the formula



in which R and R′ independently of one another are hydrogen or alkyl having 1 to 4 carbon atoms, X is hydrogen, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, allyloxy, hydroxyalkoxy having 2 to 4 carbon atoms, alkoxyalkoxy having a total of 3 to 8 carbon atoms, benzyloxy,

phenethyloxy, phenoxy, phenoxyalkoxy having 1 to 3 carbon atoms in the alkoxy part, halogen, and X_1 is hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms and halogen.

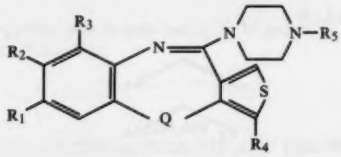
4,157,444

10-(PIPERAZINYL)THIENO[3,4-b][1,5]BENZOXAZEPINES AND 10-(PIPERAZINYL)THIENO[3,4-b][1,5]BENZOTHIAZEPINES

Jeffery B. Press, Bellvale, N.Y., and Sidney R. Safir, River Edge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 13, 1978, Ser. No. 886,233
Int. Cl.[2] **C07D** *498/04, 513/04*
U.S. Cl. 544—359 **15 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein Q is divalent oxygen or divalent sulfur; R_1 is selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms and alkoxy having from one to four carbon atoms; R_2 is selected from the group consisting of hydrogen, chloro, bromo, iodo and alkyl having from one to four carbon atoms; R_3 is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms; R_4 is selected from the group consisting of hydrogen, chloro, bromo and iodo; R_5 is selected from the group consisting of alkyl having from one to four carbon atoms and monohydroxy alkyl having from two to four carbon atoms; and the pharmacologically acceptable acid-addition salts thereof.

4,157,445

METHOD FOR THE PREPARATION OF QUINOLINE AND ANILINE COMPOUNDS

Peter Fitton, Pequannock, N.J.; Edward A. Rick, Charleston, W. Va., and Kurt Weinberg, Upper Saddle River, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,323
Int. Cl.[2] **C07D** *215/04;* **C07C** *85/11*
U.S. Cl. 546—181 **11 Claims**

1. Method of synthesizing quinoline and aniline compounds which comprises interacting (1) a mixture of a substituted aromatic hydrocarbon containing 6 to 18 aromatic ring carbon atoms, 1 or 2 nitro substituents and a replaceable hydrogen atom ortho to each nitro group with (2) an ethylenically unsaturated hydrocarbon having the formula:

$$CH_2{=}CH{-}R$$

wherein R is a monovalent radical selected from the class consisting of hydrogen, alkyl groups having 1 to about 8 carbon atoms, cycloaliphatic groups having about 5 to about 7 carbon atoms and aromatic groups having 6 to about 18 carbon atoms, in a molar ratio of (2) to (1) of about 1:2 to 20:1 in the presence of (3) a catalytic amount of a catalyst having the formula:

$$L_nM(X)_a(R)_b$$

wherein X is a monovalent radical selected from the group consisting of Br—, I—, Cl—, CH_3COO— and —CN, L is a ligand selected from the group consisting of triarylphosphines having 6 to 18 carbon atoms, trialkylphosphines having 1 to 8 carbon atoms, triarylarsines, having 6 to 18 carbon atoms, triaryl stibines having 6 to 18 carbon atoms and benzonitrile, M is a metal selected from Group VIII of the Deming periodic table consisting of palladium, platinum, ruthenium, rhodium, osmium, and iridium, R is a monovalent radical selected from the class consisting of aryl groups having 6 to 10 carbon atoms, either unsubstituted or substituted in the ortho, meta or para position with halogen, nitro or cyano groups, arylalkyl groups having 7 to about 11 carbon atoms, or alkyl groups having 1 to about 8 carbon atoms,

n is an integer having values of 1 to 4,

a is an integer having values of 1 or 2, and

b is an integer having values of 0 or 1,

at a temperature of about 50° C. to about 300° C. for at least 0.5 hours.

10. Method of synthesizing quinoline compounds which comprises interacting:

(A) a nitro substituted aromatic hydrocarbon selected from the group consisting of nitrobenzene, p-nitrotoluene, p-nitrophenetole, p-dinitrobenzene, m-dinitrobenzene, alpha-nitronaphthalene or 1,8-dinitronaphthalene, with

(B) an ethylenically unsaturated hydrocarbon selected from the group consisting of ethylene, propylene or 1-butylene, in a molar ratio of (B) to (A) of about 1:2 to 20:1 in the presence of

(C) a catalytic amount of a catalyst having the formula:

$$L_nPd(X)_a(R)_b$$

wherein X is a halogen selected from the group consisting of Cl, Br or I,

L is triphenylphosphine, and

R is a group selected from the class consisting of o-chlorophenyl, o-bromophenyl, o-iodophenyl, p-chlorophenyl, p-bromophenyl, p-iodophenyl, o-nitrophenyl, o-cyanophenyl or p-cyanophenyl,

n is an integer having values of 1 to 4,

a is an integer having values of 1 or 2, and

b is an integer having values of 0 or 1,

at a temperature of 5° to 300° C. for at least 0.5 hours.

4,157,446

3-FORMYL-PYRIDINES AND PROCESS FOR MAKING THEM

Horst Tappe, Dietzenbach, Fed. Rep. of Germany, assignor to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 819,756
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635205; Aug. 5, 1976, 2635206
Int. Cl.[2] **C07D** *213/69, 213/76*
U.S. Cl. 546—296 **2 Claims**

1. A process for the production of 3-formyl-4-methyl-2,6-dihydroxy-pyridine or its alkali metal salts by reacting 4-methyl-2,6-dihydroxy-pyridine with trihaloacetaldehyde in an aqueous-ethanolic solution in the presence of sodium acetate to form 3-(β,β,β-trihalo-α-hydroxy)-ethyl-4-methyl-2,6-dihydroxy-pyridine which is hydrolized with alkali metal hydroxide in an aqueous-ethanolic solution to form haloform and 3-formyl-4-methyl-2,6-dihydroxy-pyridine as a salt of said alkali metal and recovering 3-formyl-4-methyl-2,6-dihydroxy-pyridine as the alkali metal salt.

4,157,447

INTERMEDIATES FOR INSECTICIDAL (β-PHENYL-β-SUBSTITUTED-VINYL)CYCLOPROPANECARBOXYLATES

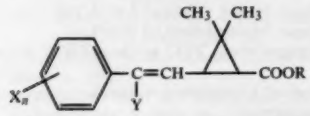
John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 718,252, Aug. 27, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,033

Int. Cl.[2] **C07C** *63/33, 69/76*

U.S. Cl. 560—8 **2 Claims**

1. A compound of the formula:



in which X is halogen, cyano, nitro, aryl, aralkyl, aryloxy, arylthio, alkyl of C_1–C_4, alkoxy of C_1–C_4, alkylthio of C_1–C_4, haloalkyl of C_1–C_2, dialkylamino in which alkyls are C_1–C_2, or methylenedioxy; Y is halogen, or haloalkyl of 1 to 2 carbon atoms; n is 0, 1, 2, or 3; and R is hydrogen or lower alkyl having 1 to 4 carbon atoms.

4,157,448

ω-ARYL-12,13(E)-DIDEHYDRO-13,14-DIHYDRO-PGD COMPOUNDS

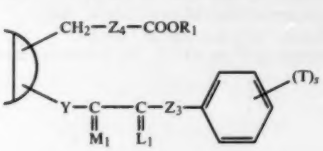
David C. Peterson, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 809,248, Jun. 23, 1977, Pat. No. 4,099,014 and Ser. No. 809,249, Jun. 23, 1977, Pat. No. 4,142,052, which are a division of Ser. No. 614,214, Sep. 17, 1975. This application May 8, 1978, Ser. No. 903,421

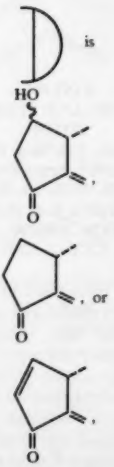
Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 560—53 **127 Claims**

1. A prostaglandin analog of the formula



wherein



wherein Y is $=CH-CH_2-$;

wherein Z_4 is

(1) cis-$CH=CH-CH_2-(CH_2)_g-CF_2-$,

(2) cis-$CH=CH-CH_2-(CH_2)_g-CH_2-$,

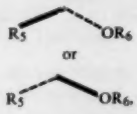
(3) cis-$CH_2-CH=CH-(CH_2)_g-CH_2-$,

(4) $-(CH_2)_3-(CH_2)_g-CF_2-$, or

(5) $-(CH_2)_3-(CH_2)_g-CH2-$,

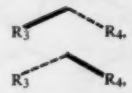
wherein g is one, 2, or 3;

wherein M_1 is

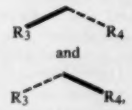


wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is hydrogen or fluoro only when the other is hydrogen or fluoro;

wherein Z_3 is oxa or methylene

wherein T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,157,449

ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF

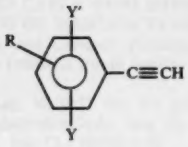
Julius Diamond, Morris Plains, N.J., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 574,837, May 14, 1975, which is a continuation of Ser. No. 431,254, Jan. 7, 1974, Pat. No. 3,923,910, which is a division of Ser. No. 268,419, Jul. 3, 1972, Pat. No. 3,852,364. This application Nov. 23, 1976, Ser. No. 744,334

Int. Cl.[2] **C07C** *39/18, 43/20, 69/14*

U.S. Cl. 560—141 **5 Claims**

1. A compound of the formula:



where R is cycloalkyl of 5 to 7 carbon atoms,

1 to 7 carbon atoms alkyl-substituted cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms, phenyl, or substituted phenyl where the substituent is Y″;

Y and Y′ are each selected from the group consisting of hydrogen, hydroxy, alkoxy of 1 to 6 carbon atoms and alkanoyloxy of 1 to 3 carbon atoms;

Y″ is selected from the group consisting of hydroxy, alkoxy of 1 to 6 carbon atoms, alkanoyloxy of 1 to 3 carbon atoms, alkyl of 1 to 7 carbon atoms, trifluoromethyl and halo,

with the proviso that at least one of Y, Y′ and Y″ is hydroxy, alkoxy or alkanoyloxy.

4,157,450

BENZENE-1,3,5-TRIS-ACETOXIME AND THE PROCESS FOR MAKING PHLOROGLUCINOL THEREWITH

Hans Zengel, Kleinwallstradt, and Manfred Bergfeld, Erlenbach, both of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 823,789, Aug. 11, 1977, Pat. No. 4,115,451, which is a division of Ser. No. 796,109, May 12, 1977, Pat. No. 4,071,555. This application May 1, 1978, Ser. No. 901,669

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621431

Int. Cl.[2] **C07C** *39/10*

U.S. Cl. 568—763 **2 Claims**

1. A process for making phloroglucinol comprising (1) subjecting 1,3,5-tris-acetoxime to a Beckmann rearrangement by suspending said acetoxime in trifluoroacetic acid and heating the reaction mixture to a temperature from about 80° to about 150° C. for a length of time sufficient to allow substantially all of the acetoxime to undergo said rearrangement; (2) rendering the reaction mixture obtained by the Beckmann rearrangement substantially free of excess trifluoroacetic acid; and (3) hydrolyzing the trifluoroacetic acid-free mixture with an aqueous mineral acid at a temperature from about 100° to about 200° C., at the corresponding partial pressure.

4,157,451

PROCESS FOR THE PREPARATION OF IPSDIENOL

Günther Ohloff, and Wolfgang K. Giersch, both of Bernex/-Geneva, Switzerland, assignors to Firmenich, S.A., Geneva, Switzerland

Filed Nov. 7, 1977, Ser. No. 849,269

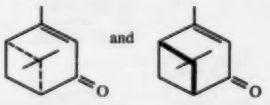
Claims priority, application Switzerland, Nov. 12, 1976, 14263/76

Int. Cl.[2] **C07C** *33/02*

U.S. Cl. 569—875 **5 Claims**

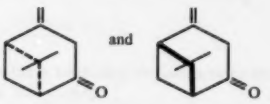
1. Process for the preparation of enantiomers of 2-methyl-6-methylene-octa-2,7-dien-4-ol which comprises the following steps:

(a) isomerizing the cyclic double bond of an unsaturated ketone of formulae



(IIa) (IIb)

by means of a basic isomerizing agent to obtain a compound of formulae



(IIIa) (IIIb)

respectively;

(b) reducing the thus obtained compound to obtain (+) or (−)-cis-isoverbenol or (+) or (−)-trans-isoverbenol respectively; and

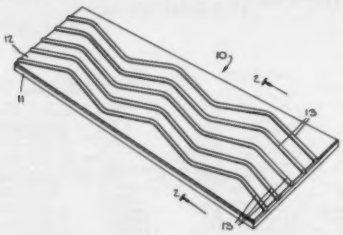
(c) heating the thus obtained (−)-cis-and(−)-trans- or (+)-cis-and (+)-trans-isoverbenol products at a temperature of from about 400° to 700° C. for a period of time sufficient to produce respectively the S(+) or R(−) enantiomers of 2-methyl-6-methylene octa-2,7-dien-4-ol; said reduction of the formulae IIIa and IIIb compound being by means of an alkali metal borohydride or aluminohydride to obtain the (+)- and (−)-cis-isoverbenol and said reduction of the formulae IIIa and IIIb compound being by means of aluminum isopropoxide in isopropanol or an alkali metal in liquid ammonia to obtain the (−)- and (+)-trans-isoverbenol respectively.

4,157,452

ELECTRIC POWER CABLE WITH IMPROVED SCREEN AND METHOD OF MANUFACTURE THEREOF

Vincenzo Pignataro, and Giovanni Portinari, both of Milan, Italy, assignors to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed Aug. 30, 1977, Ser. No. 829,137
Claims priority, application Italy, Aug. 30, 1976, 26648 A/76
Int. Cl.[2] H01B *9/02*
U.S. Cl. 174—36 16 Claims



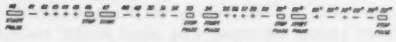
1. A composite screen for electric power cables comprising a relatively long and narrow metal tape having an adherent coating of a thermoplastic resin on at least one surface thereof with a plurality of spaced, separate, individual and similar metal wires which are without intermediate electrical conductors conductively interconnecting said wires transversely of their lengths and which are incompletely embedded in said coating so that in its flat, free state part of the surface of each wire facing away from said tape extends above the adjacent surface of said coating and is free of insulating material and exposed for conductive contact with an adjacent conductor, said wires being closely spaced and parallel to each other, extending lengthwise of said tape, and being distributed across and within the width of the tape.

4,157,453

CRYPTOGRAPHIC TELEGRAM TRANSMISSION SYSTEM

Leo Rosen, Apt. C, Heritage Apartments, River Rd., Essex, Conn. 06426

Filed Oct. 10, 1944, Ser. No. 558,067
Int. Cl.[2] H04K *1/06;* H04L *9/00*
U.S. Cl. 178—22 12 Claims



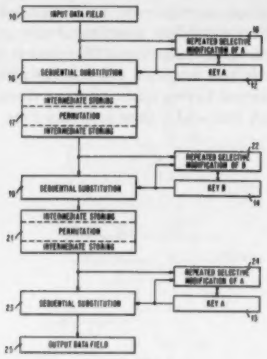
1. In a communication system including the representation of different characters by normally dissimilar groups of impulses, the method of enciphering a message which includes transposing the impulses from place to place within the respective character groups and from one character group to another.

4,157,454

METHOD AND SYSTEM FOR MACHINE ENCIPHERING AND DECIPHERING

Wolfram Becker, Niedernhausen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,251
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658065
Int. Cl.[2] H04L *9/02*
U.S. Cl. 178—22 25 Claims



1. Method for the enciphering and authorized deciphering of multi-digit data, comprising

subjecting successive data segments, under control of corresponding segments of an enciphering key, to a substitution operation generating a modified version of the data segment; and

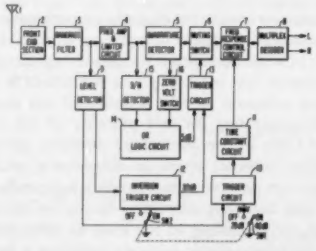
in each substitution operation, selecting one of several given modification modes, as a predetermined function of a data segment and the corresponding key segment for changing the enciphering key before the next substitution operation upon the next corresponding segment.

4,157,455

FM STEREOPHONIC RECEIVER HAVING MUTING AND MODE CHANGING

Masanao Okatani; Yoshiaki Ishibashi, and Yoshiro Sugai, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 14, 1977, Ser. No. 815,749
Claims priority, application Japan, Jul. 14, 1976, 51/83717
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—1 GM 9 Claims



1. An FM stereophonic receiver having a front end producing an output IF signal, a detector responsive to said output IF signal and providing an output audio signal, and a multiplex decoder generating a stereophonic output audio signal when the level of said IF signal and a stereophonic pilot signal com-

ponent of said audio signal are above predetermined levels and generating a monaural audio output signal when said IF signal and said stereophonic pilot signal component are below said predetermined levels, the improvement comprising:

(a) muting circuit means for coupling said output audio signal to an output only when the level of said audio IF signal is greater than or equal to a fixed muting operation point; and

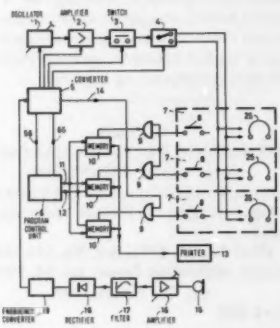
(b) mode changing circuit means responsive to said output of said muting circuit for providing a stereophonic output audio signal when the level of said output IF signal is above a fixed stereophonic and monaural changeover point and for providing a monaural output audio signal when the level of said output IF signal is less than said stereophonic and monaural changeover point, said mode changing circuit having a time constant circuit means with a fast attack time and a slow recovery time.

4,157,456

AUDIOMETER

Rainer Voss, Oststeinbek, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 15, 1978, Ser. No. 877,826
Int. Cl.[2] H04R *29/00*
U.S. Cl. 179—1 N **11 Claims**



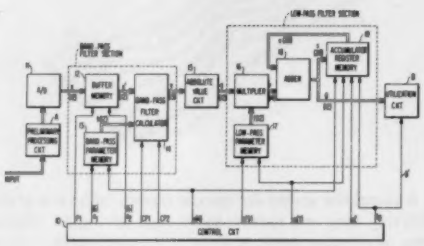
1. An audiometer system for digitally recording data for one or more audiometric patients comprising, a plurality of test stations each of which comprises a reproducing device and an actuating element for recording test tones which are perceived, means common to said plurality of test stations for automatically generating for said plurality of test stations a series of test tones for predetermined duration, different frequency and/or different levels in accordance with a programme, said tone generating means being independent of any control by said actuating elements, means for producing a digital signal corresponding to the level or frequency of the test tone, a digital electronic memory including a write input or an information input allocated to each test station and controlled by the respective actuating element of its test station to control the passage of said digital signal into said memory via the information and/or the address inputs of the memory, and an output device connected to read-out the signals stored in the digital memory.

4,157,457

FREQUENCY ANALYZER COMPRISING A DIGITAL BAND-PASS AND A DIGITAL LOW-PASS FILTER SECTION BOTH OPERABLE IN A TIME-DIVISION FASHION

Hiroaki Sakoe, and Seibi Chiba, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1978, Ser. No. 883,971
Claims priority, application Japan, Mar. 4, 1977, 52-23610
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SA **5 Claims**



1. A digital frequency analyzer responsive to those digital samples of a frequency analyzer input signal which are supplied thereto in successive sampling periods, respectively, for producing a frequency analyzer output signal representative of those frequency analysis results of a predetermined number of channels into which said input signal is frequency analyzed for every analyzing frame period equal to a first presecribed number of said sampling periods, each of said sampling periods being equal to a predetermined number of intervals equal to the number of channels, said digital frequency analyzer comprising:

a buffer memory for memorizing a preselected number of said digital samples with the memorized digital samples renewed in every sampling period;

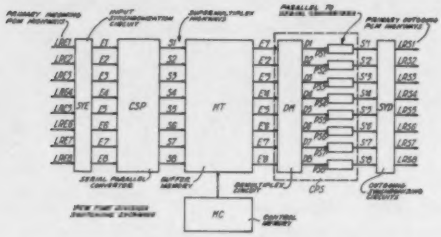
a band-pass filter section for subjecting said memorized digital samples given from said buffer memory to preselected band-pass filter processing to successively produce band-pass filter results for the respective channels in every sampling period, the band-pass filter results being thus successively produced in the respective intervals; and

a low-pass filter section generating a low pass filter impulse response having a start and an end point and prescribed values in that duration between said start and said end points which is equal to a second prescribed number of said frame periods and also generating the impulse response with its phase, namely, the duration, shifted by said frame period successively as often as said second prescribed number for calculating products each of said band-pass filter results and the prescribed values read in the interval of production of said each band-pass filter results out of the impulse responses generated with the phase unshifted and shifted, for accumulating absolute values of products successively calculated for the respective channels and the respective phases, and for producing as said frequency analysis results the accumulated products for the respective channels in those of said sampling periods in which the generated impulse responses have the respective end points.

4,157,458
CIRCUIT FOR USE EITHER AS A SERIAL-PARALLEL CONVERTER AND MULTIPLEXER OR A PARALLEL-SERIAL CONVERTER AND DEMULTIPLEXER IN DIGITAL TRANSMISSION SYSTEMS

Alain Y. D. Roche, 37, Avenue de Lorraine, Ker Heul - Lannion, France (22300)

Filed Dec. 14, 1977, Ser. No. 860,484
Claims priority, application France, Dec. 30, 1976, 7639833
Int. Cl.[2] H04J *3/04*
U.S. Cl. 179—15 A 5 Claims



1. A converter circuit for a PCM switching system, means for connecting up to a predetermined number of primary digital multiplex highways with synchronized time frames and bit rates to said converter circuit, said converter comprising means for converting primary multiplex highway channel data from a serial mode into a parallel mode, means for multiplexing said parallel mode channel data to form a supermultiplex highway of signals, means for providing a plurality of cyclically recurring time slots with as many parallel mode channels as there are primary digital multiplex highway connections on said converter circuit, said channel data being arranged in n-bit words, m-1 serial-write, serial-read output shift register means in said converter circuit, each of said m-1 shift register means having one stage less than the number of stages in the preceding shift register means, m parallel-write serial-read input shift register means for receiving signals from individually associated ones of said primary highways, each of said input shift register means having n-stages, means for connecting each input shift register read output terminal to a corresponding output shift register write input terminal, m converter circuit output means respectively connected to the corresponding output terminals of said output shift register means, a loop-connected parallel-read n-stage control shift register means, means for synchronously performing every shift in every shift register at the same primary digital highway bit rate, write control input means on each of said input and control shift register means for causing that shift register to write instead of to shift, means for connecting the write control inputs of said input shift register means to read outputs of said control shift register means in accordance with the rank of said input shift register means, and means for applying an initial signal to the write control input of said control shift register means for initiating an operation said control shift register.

4,157,459
ELECTRONIC AUDIO SIGNALLING DEVICE FOR TELEPHONES

Terry D. Bush, and D. Joseph Denen, both of Columbus, Ohio, assignors to Floyd Bell Associates Inc., Columbus, Ohio

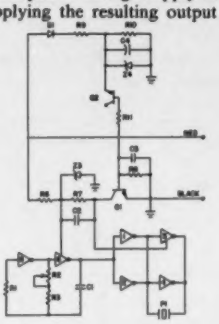
Filed Oct. 19, 1977, Ser. No. 843,456
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—84 T 7 Claims

1. A signalling device for telephones or the like comprising a housing, a printed circuit board mounted within the housing and carrying solid state circuit components in a circuit, a piezoelectric-actuated flexible diaphragm also mounted within the housing in spaced relationship to said circuit board, said flexible diaphragm carrying a piezoelectric element connected in the circuit, said circuit including:

a set of leads adapted to be connected to the telephone voltage supply line for receiving signalling voltage therefrom;

a square wave oscillator audio-signalling circuit connected to said leads and including a square wave driving network with oscillator frequency controlling components connected to a buffer driving network including said piezoelectric element;

a shunt-type rectifying and voltage-limiting network connected between the leads and the oscillator circuit for receiving, shunt-rectifying, and limiting the voltage supplied by the telephone voltage supply line to a selected range and applying the resulting output voltage to the



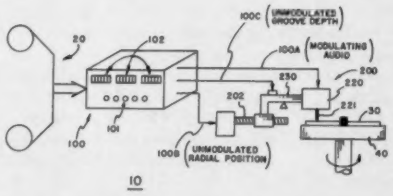
oscillator circuit, said rectifying and voltage-limiting network including a voltage-dropping resistance, and a voltage-clamping element for suppressing the application of voltages other than proper signalling voltages to the oscillator circuit; and

a disabling network connected between the leads and the oscillator circuit for disabling the oscillator circuit except when proper signalling voltage is supplied through said leads so as to prevent undesired audio outputs in the telephone to which it is applied when voltages other than proper signalling voltages are present on the telephone voltage supply line, said disabling network, including signal-attenuating components for preventing application of voltages to the oscillator circuit unless they are in the selected range of proper signalling voltages.

4,157,460
APPARATUS FOR CUTTING AUDIO DISKS

Louis J. Bottali, Ridgefield, Conn.; Robert A. Finger, Yonkers, N.Y., and Daniel W. Gravereaux, New Canaan, Conn., assignors to CBS Inc., New York, N.Y.

Filed Sep. 22, 1977, Ser. No. 835,604
Int. Cl.[2] G11B *3/78*
U.S. Cl. 179—100.4 C 29 Claims



1. For use in conjunction with an audio recording apparatus which receives audio signals and forms spiral grooves in a recording disc, said apparatus including means for rotating the

recording disc, a cutter for cutting grooves in the disc, cutter transducer means for modulating the instantaneous position of the cutter as a function of the audio signals, and an electromechanical subsystem responsive to control signals for directing the unmodulated radial position of the cutter; a system for generating control signals which control operation of the electromechanical subsystem, comprising:

means for sampling audio signals to be recorded;

means for storing the sample values;

means for determining and storing the current relative unmodulated radial position of the cutter;

means responsive to current sample values, the current relative unmodulated radial position of the cutter, and to prior sample values stored when the disc was at the same azimuthal position during cutting of the previous groove, for computing a computed relative unmodulated radial position of the cutter necessary to avoid overcutting into the previous groove; and

means responsive to the current relative unmodulated radial position of the cutter and the computed relative unmodulated radial position of the cutter for generating control signals to modify the unmodulated radial position of the cutter only when the current relative unmodulated radial position of the cutter is insufficient to avoid overcutting.

4,157,461

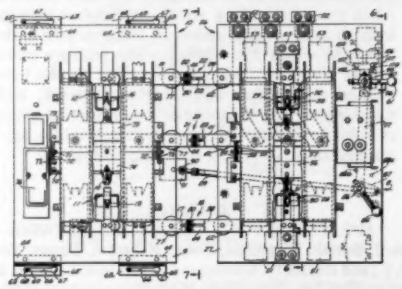
AUTOMATIC TRANSFER SWITCH AND BYPASS SWITCH ARRANGEMENT

Dominick M. Wiktor, Cranford, N.J., assignor to Automatic Switch Company, Florham Park, N.J.

Filed Oct. 19, 1977, Ser. No. 843,387

Int. Cl.[2] H01H *3/00, 9/00;* **H02J** *7/00*

U.S. Cl. 200—18 **15 Claims**



11. An automatic transfer and bypass switch arrangement comprising:

(a) an automatic transfer switch which can be switched between one condition for connecting a normal source of power to a load and an alternative condition for connecting an emergency source of power to the load,

(b) a bypass switch having three alternative conditions, the bypass switch in one condition connecting the normal source of power to the load, in a second condition connecting the emergency source of power to the load, and in a third condition connecting neither source of power to the load, and

(e) means for preventing switching of the bypass switch to a condition in which it connects the load to a source other than the source being connected to the load by the transfer switch.

4,157,462

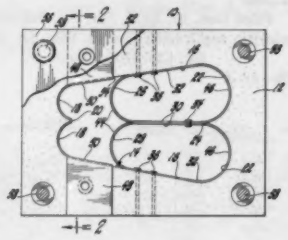
SENSOR

Houston F. Blanchard, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 26, 1977, Ser. No. 845,607

Int. Cl.[2] H01H *35/14*

U.S. Cl. 200—61.45 R **7 Claims**



1. A sensor comprising, in combination, a housing including a pair of spaced bearing portions, a pair of flexible bands of spring material disposed between said bearing portions and being forced thereby into generally elongate shape with abutting adjacent portions and remote portions engaging a respective bearing portion, means securing said abutting portions to each other, means securing said remote portions to a respective bearing portion of the housing, a velocity change of predetermined extent applied to said bands causing said bands to concurrently roll relative to each other and along said bearing portions, (indicator means operated by said bands as said bands roll) contact means actuated upon rolling movement of said bands to indicate the occurrence of said velocity change, and means resisting rolling of said bands unless said velocity change occurs.

4,157,463

SWITCH APPARATUS

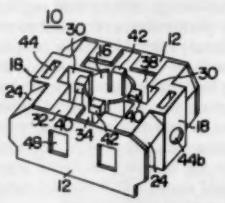
Teizo Fujita, Ibaraki, Japan, assignor to Izumi Denki Corporation, Osaka, Japan

Filed Aug. 3, 1977, Ser. No. 829,113

Claims priority, application Japan, Sep. 14, 1976, 51-110552

Int. Cl.[2] H01H *9/02*

U.S. Cl. 200—307 **30 Claims**



1. A switch apparatus including at least one contact block which is adapted to be coupled directly against other contact blocks similar thereto in multi-stages, said contact block comprising:

a casing of an electrical insulating material having a central axis;

means for mechanically coupling said casing into direct contact with a casing of another contact block having a configuration similar to that of said contact block, along a common axis including the respective central axes of said casing and the casing of said other contact block, in order to couple said contact block with said other contact block;

at least one set of electrical contact means contained in said

casing and including a contactor for actuating said contact means;

contact actuator means of an electrical insulating materail carrying said contactor, said contact actuator means being contained in said casing and supported movably in parallel to said central axis between first position where said contact means is unactuated and a second position where said contact means is actuated, said contact actuator means having a first predetermined length substantially equal to the length of said casing along said central axis, said contact actuator means including a contactor carrying portion for carrying said contactor, at least one actuated portion protruded in the direction parallel to said central axis by a second predetermined length outwardly of one surface of said casing perpendicular to said central axis of said casing, to receive an external force, when said contact actuator means is in said first position, and at least one actuating portion adapted to be come in an abutment contact with an end of the actuated portion of the contact actuator means of said other contact block when said contact block is coupled with said other contact block;

bias means for applying a bias force to said contact actuator meeans in order to normally urge said contact actuator means to said first position; and

said contact actuator means being at least one of a first contact actuator member and a second contact actuator member selected in assemblying said contact block, said first contact actuator member including a first body portion elongated along a first axis, said first body portion including an actuated portion, a contactor carrying portion and an actuating portion aligned along said first axis, said actuated portion, said contactor carrying portion and said actuating portion of said first body portion being equivalent to said actuated portion, contactor carrying portion and actuating portion of said contact actuator means respectively, said second contact actuator member including a second body portion elongated along a second axis, a third body portion elongated along a third axis in parallel to said second axis, and a coupling portion coupling said second and third body portions to each other, a contactor carrying portion equivalent to said contactor carrying portion of said contact actuator means being formed on selected one of said second and third body portions, at least one actuated portion equivalent to said actuated portion of said contact actuator means being formed on at least one of said second and third body portions, at least one actuating portion equivalent in size to said actuating portion of said contact actuator means being formed on at least one of said second and third body portions.

4,157,464

MICROWAVE HEATING SYSTEM

William V. Smith, Chelmsford; Charles L. Gilliatt, Andover, and Richard H. Edgar, Chelmsford, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 19, 1977, Ser. No. 825,885

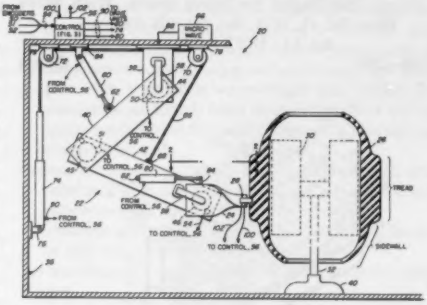
Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 R **10 Claims**

1. In a microwave heating system, an apparatus for positioning a radiator of microwave energy relative to the surface of an object to be heated by said energy, said apparatus comprising:

means coupled to said radiator for signaling the presence of irregularities in the shape of said surface;

means for varying the orientation of said radiator in accordance with said shape to maintain the orientation of said radiator relative to said surface; and



means coupled to said signaling means for adjusting a spacing between said radiator and said surface.

4,157,465

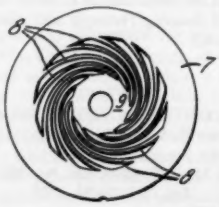
GAS-LUBRICATED BEARINGS

Geoffrey Beardmore, and Hugh N. Evans, both of Cheltenham, England, assignors to Smiths Industries Limited, London, England

Continuation of Ser. No. 501,373, Aug. 28, 1974, abandoned, which is a continuation of Ser. No. 270,414, Jan. 10, 1972, abandoned, which is a continuation of Ser. No. 9,728, Feb. 9, 1970, abandoned. This application May 27, 1975, Ser. No. 581,234

Int. Cl.[2] B23K 9/00

U.S. Cl. 219—121 EM **4 Claims**



1. A method of manufacturing a flat disc-like grooved bearing part of a gas-lubricated bearing wherein the bearing part in its final form has shallow grooves of a predetermined depth on a surface thereof including the steps of:

selecting a blank for the bearing part from a hard, wear-resistant material,

machining said surface of the blank to be optically flat within ten micro-inches,

masking said surface so that only those portions corresponding to the intended grooves are exposed,

subjecting the masked face of the blank to ionic bombardment so as to form said shallow grooves therein with smooth groove bottoms and without undercutting of the sidewalls by the sputtering of material from the blank,

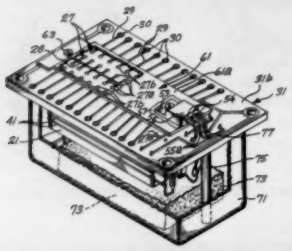
and terminating the ionic bombardment when said grooves have attained a depth of at least 100 micro-inches.

4,157,466

CRYSTAL OVEN FOR MAINTAINING CRYSTALS AT A PREDETERMINED TEMPERATURE

James R. Herrin, 3524 Bagley Ave. North, Seattle, Wash. 98103

Filed Jul. 31, 1978, Ser. No. 929,800
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—210 **9 Claims**



1. In a crystal oven including: a board of electrically insulating material, said board having first and second, opposing surfaces; a housing disposed in proximity to said first surface of said board; a plurality of crystal sockets mounted within said housing; a heating wire coiled about said housing; and, an oven temperature control circuit, including a semiconductor device having a plate-like member electrically interconnected with a current-carrying terminal of said semiconductor device, which is electrically interconnected with said heating wire and which is responsive to the temperature within said housing, for controlling the amount of current flowing through said heating wire; the improvement comprising:

a plurality of crystal socket terminals located on said second surface of said board and electrically interconnected with said plurality of crystal sockets;

a heat sink supported in proximity to said second surface of said board so as to be separated from but to overlie said plurality of crystal socket terminals, and

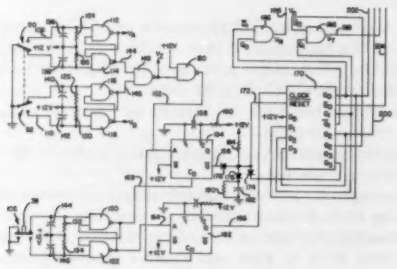
thermally conductive means securing said plate-like member of said semiconductor device to said heat sink, whereby heat generated by said plate-like member as a result of current through said semiconductor device is conductively distributed to said heat sink to heat said plurality of crystal socket terminals and to thereby reduce heat transfer from said housing through said plurality of crystal socket terminals.

4,157,467

SEQUENTIAL CONTROL SYSTEM FOR A LIFT TRUCK

John I. Koeper, New Bremen, Ohio, assignor to Crown Controls Corporation, New Bremen, Ohio

Filed Mar. 17, 1978, Ser. No. 887,615
Int. Cl.[2] G06M *3/02*
U.S. Cl. 235—92 CT **11 Claims**



1. A control system for controlling a plurality of power functions of an industrial lift truck in response to movement of a manually operable control, said control having a first control position, a second control position, and a neutral position intermediate said first and second control positions, comprising:

manually actuatable function control switch means,

counter means, responsive to said function control switch means, for changing its count state each time said function control switch means is actuated,

detector means, responsive to said counter means, for providing detector outputs in response to the count state of said counter means, each of the detector output states being associated with the control of a respective one of said power functions,

a plurality of motive means for performing said plurality of power functions,

power source means for providing power for performance of said power functions by said plurality of motive means,

power control means, connected to said manually operable control, for providing power from said power source means in dependence upon the position of said manually operable control, and

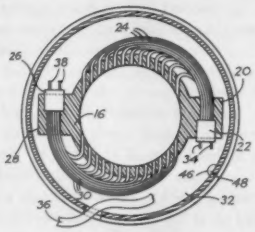
distributing means, responsive to said detector means, for distributing power from said power control means to said motive means in dependence upon the count state of said counter means, whereby any of said plurality of power functions may be controlled with said manually operable control by moving said control into its said first and second control positions.

4,157,468

METHOD AND APPARATUS FOR COUNTING PARTICLES OF PARTICULATE MATERIAL

Michael P. Primiano, Lake Oswego, Oreg., assignor to Ronald R. Olson and Kathleen R. Olson, both of Madras, Oreg.

Filed Jun. 10, 1977, Ser. No. 805,413
Int. Cl.[2] G01D *21/04*
U.S. Cl. 250—223 R **8 Claims**



1. The method of counting particles of particulate material, comprising:

(a) providing a flat beam of infrared or visible light radiation having a thickness not substantially exceeding the minimum thickness of particles to be counted and a width at least substantially equal to the cross sectional width of a passageway through which particles are to be passed,

(b) projecting said flat beam of radiation flatwise transversely across substantially the entire cross sectional area of a passageway through which particles are to be passed,

(c) detecting said beam as a field of radiation of substantially constant intensity,

(d) passing particles to be counted through said passageway and said flat field of radiation,

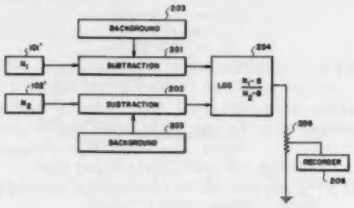
(e) detecting the change in intensity of said field of radiation resulting from the passage of each particle through said field, and

(f) utilizing said detected change in intensity to actuate an electronic counter to count said particle.

4,157,469
PULSED NEUTRON WELL LOGGING APPARATUS HAVING MEANS FOR DETERMINING BACKGROUND RADIATION

Russel R. Randall, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 2, 1977, Ser. No. 847,986
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—262 3 Claims



1. Apparatus for radioactivity well logging, comprising:
an elongated instrument adapted to traverse an earth borehole;
a source of neutrons within said instrument;
radiation detection means within said instrument in spaced relation to said source, said detection means including means to generate electrical signals indicative of such detected radiation;
first, second and third gates within said instrument connected to the output of said detection means; and
means within said instrument to repetitively pulse said neutron source and to trigger said first, second and third gates in timed relationship with the pulsing of said neutron source, said means being characterized by electrical circuits connected to the outputs of said first, second and third gates adapted to generate additional electrical signals functionally related to

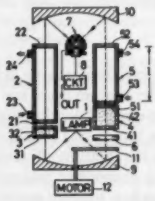
$$K \operatorname{Log}\left[\frac{N_1 - B}{N_2 - B}\right],$$

where K is a constant, N_1 is a function of the number of radioactivity counts detected during the first gate, N_2 is a function of the number of radioactivity counts detected during the second gate and B is a function of the background radiation.

4,157,470
INFRARED GAS ANALYZER

Mitsuo Kotaka; Hisao Takahara; Kaisuke Muraki; Ryo Takahashi, and Tamizo Matsuura, all of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Mar. 20, 1978, Ser. No. 888,223
Claims priority, application Japan, Mar. 24, 1977, 52-32432; Mar. 25, 1977, 52-36767[U]; Nov. 18, 1977, 52-139095
Int. Cl.[2] G01N *21/26*
U.S. Cl. 250—345 8 Claims

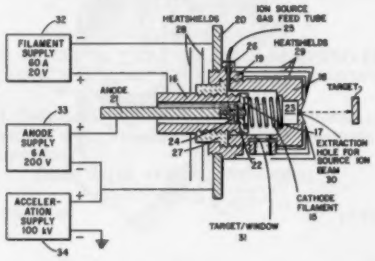


1. An infrared gas analyzer comprising:
an infrared source for emitting infrared rays;
a light sensor responsive to the quantity of light received;
means for directing some of said infrared rays through a measuring-light optical system to said light sensor, said measuring-light optical system comprising
a sample cell filled with a sample gas,
a first filter for principally transmitting infrared rays of a fixed wave-length band included within the absorption wave-length band of a measurement component, and
a temperature compensating cell enclosing a gas which has a part of its absorption wave-length band within the transmission wave length band of said first filter but having a spectrum different from the spectrum of said measurement component; and
means for directing others of said infrared rays through a reference-light optical system to said light sensor, said reference-light optical system comprising
an interference cell enclosing a gas containing a fixed density of said measurement component,
an interference compensating cell filled with the sample gas, and
a second filter for transmitting infrared rays of a wavelength band that includes the major part of the transmission wave-length band of said first filter.

4,157,471
HIGH TEMPERATURE ION SOURCE FOR AN ON-LINE ISOTOPE SEPARATOR

Ronald L. Mlekodaj, Oak Ridge, Tenn., assignor to United States Department of Energy, Washington, D.C.

Filed May 10, 1978, Ser. No. 904,677
Int. Cl.[2] H01J *27/00*
U.S. Cl. 250—423 R 5 Claims



1. A high temperature ion source for use with an on-line cyclotron comprising a metallic base plate, an annular graphite support piece fitted within said base plate, a hollow graphite member provided with an ion extraction hole at one end thereof and being open at its other end with said open end fitted within said support piece, the hollow interior of said member forming a discharge chamber, a hollow graphite tube extending within the open end of said hollow member, a metallic washer fitted against the extended end portion of said tube, a first insulator mounted between said support piece and said hollow tube and abuting the open end of said hollow member, a metallic filament mounted within said discharge chamber with one end thereof pressed against said washer and the other end thereof pressed against an interior wall of said chamber, the interior walls of said hollow member closely encompassing said filament to provide said chamber with a small volume, an elongated anode electrode extending through said hollow tube and provided with a replaceable tip, said tip extending through said washer, a second insulator mounted between said anode tip and the interior surface of said hollow tube, a gas feed tube coupled to said discharge chamber and adapted to supply support gas thereto, an opening provided in one wall of said hollow member, a combined target/window and graphite felt catcher mounted in said opening, a filament power supply source coupled to said filament, an anode power supply source coupled to said anode electrode, and an acceleration power supply source coupled to said hollow member, said opening

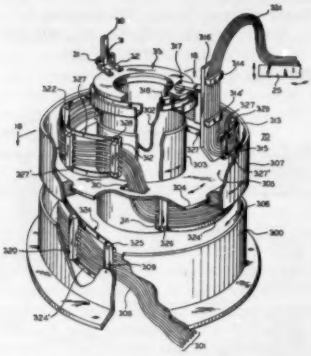
with its target/window being adapted to be coupled to a selected heavy-ion beam from said cyclotron, whereby during operations of said ion source said heavy-ion beam will interact with said target foil to provide radioactive products which diffuse through said catcher into said chamber where they are ionized by the discharge plasma within said chamber before being extracted through said extraction hole.

4,157,472

X-RAY BODY SCANNER FOR COMPUTERIZED TOMOGRAPHY

William J. Beck, Jr., Scotia, N.Y., and David M. Barrett, Brookfield, Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 16, 1976, Ser. No. 723,745
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—445 T **9 Claims**



1. Apparatus for examining at least a portion of a body with a scanned x-ray beam comprising: rotatable means which are rotatable through a substantial angle about an axis, an x-ray source mounted on said rotatable means on one side of said axis and radiation detector means mounted on said rotatable means generally opposite of said axis from said x-ray source to enable said source and detector means to rotate about said axis together and about a body portion to be examined, and at least one elongated flexible means such as a cable leading to said rotatable means, the improvement for handling said flexible means to accommodate rotation of less or more than 360° by said rotatable means, comprising:

idler means mounted for rotation coaxially with said axis, said flexible means having incoming and outgoing regions with said outgoing region leading to and connected for rotation with said rotatable means and said flexible means between said incoming and outgoing regions being formed into at least two spiral portions which are axially displaced from each other and disposed about the axis of said idler means, and

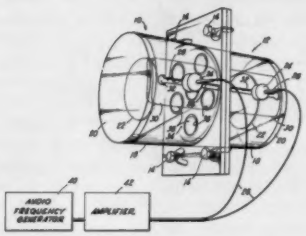
means for fastening said flexible means to said idler means intermediately of said spiral portions so that torque applied to said idler means by winding or unwinding the one spiral which has its outgoing region connected to said rotatable means will be transmitted to the other of the spirals to wind or unwind it, respectively, concurrently with said on spiral.

4,157,473

SIMPLIFIED FAST NEUTRON DOSIMETER

Mehdi Sohrabi, Atlanta, Ga., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 8, 1975, Ser. No. 638,899
Int. Cl.[2] G01T *5/02, 3/00*
U.S. Cl. 250—473 **5 Claims**



1. A method utilizing a polycarbonate foil in radiation dosimetry, comprising the steps of:

exposing said polycarbonate foil to a quantity of fast-neutron radiation for producing recoil particle tracks in said polycarbonate foil; and

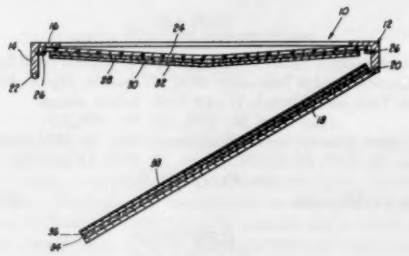
electrochemically etching said irradiated polycarbonate foil for substantially enlarging said recoil particle tracks by (a) immersing said irradiated polycarbonate foil in a basic etchant solution and (b) simultaneously subjecting said foil to a high voltage, ranging from 100 V (RMS) to 1500 V (RMS) and having a frequency range from 20 Hz to 20 kHz, whereby said quantity of fast neutron radiation may be readily determined.

4,157,474

X-RAY FILM CASSETTE

Paul G. Koontz, Granada Hills; Arthur M. Cantu, Thousand Oaks, and Richard L. Wright, Canoga Park, all of Calif., assignors to Hipoint Research, Inc., Van Nuys, Calif.

Continuation-in-part of Ser. No. 797,442, May 16, 1977, abandoned. This application Aug. 1, 1977, Ser. No. 820,599
Int. Cl.[2] G03D *13/08*
U.S. Cl. 250—480 **10 Claims**



1. An improved x-ray film cassette which comprises;

a frame having sides and an open top and bottom;

a resilient concave-convex window member attached to and closing the open top of said frame, the convex side of said member facing the bottom of said frame, said window member being a composite material comprised of powdered carbon and a fibrous material selected from the group consisting of synthetic organic fibers, carbon filaments and both synthetic organic fibers and carbon filaments held in a matrix of cured plastic material;

a film support plate closing the bottom of said frame and hingedly attached thereto so that said support plate can be

selectively opened and closed, said support plate being spaced from said window member whereby when said support plate is in the closed position with x-ray film supported thereon, said window member is deformed into a substantially flat shape and said x-ray film is clamped under pressure over its entire surface area between said window member and said support plate; and

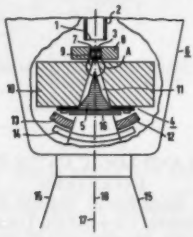
means for locking said support plate in the closed position attached to said frame.

4,157,475

ELECTRON ACCELERATOR COMPRISING A TARGET EXPOSED TO THE ELECTRON BEAM

Eberhard Stock, Erlangen, Fed. Rep. of Germany, and Leonhard Taumann, Walnut Creek, Calif., assignors to Applied Radiation Corporation, Walnut Creek, Calif.

Filed Dec. 22, 1977, Ser. No. 863,514
Claims priority, application Canada, Oct. 21, 1977, 289258
Int. Cl.[2] H01J *35/00*
U.S. Cl. 250—503 **6 Claims**



1. In an electron accelerator including a target exposed to the electron beam for the purpose of producing x-ray bremsstrahlung, a collimator assembly for providing a compensated dose characteristic over the central region of the cross section of the transmitted x-ray cone, wherein the improvement comprises said collimator assembly having inner wall surfaces at the margin of the x-ray cone which are roughened-up in a direction transverse to the radiation for providing a dose rate at the margin of the transmitted x-ray cone which is relatively uniform and matched to the dose rate at the central region of the transmitted cone, said inner wall surfaces being grooved such that a major portion of the grooved wall is formed by groove portions with a width in the radiation direction of not greater than five millimeters.

4,157,476

DENTAL X-RAY TUBE HEAD

Richard A. O'Connor, New Berlin, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 3, 1978, Ser. No. 874,952
Int. Cl.[2] H01J *35/16;* H05G *3/00*
U.S. Cl. 250—520 **1 Claim**

1. A dental x-ray tube head comprising:

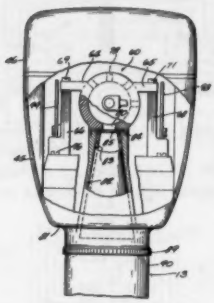
a housing for containing dielectric coolant fluid and being defined by a plurality of walls,

an x-ray tube in said housing for projecting a primary x-ray beam in a predetermined path toward an examination subject,

a hollow x-ray shielding casing element located in said housing for being immersed in coolant fluid and encasing said x-ray tube and having an aperture through which said primary beam projects, said aperture being surrounded by a recess and being spaced by a substantial distance from one of the walls of said housing,

a tubular member formed integrally with said one wall of said housing and extending from said one wall toward said aperture, said member surrounding the path in which said primary beam is projected and having an end terminating in proximity with said shielding casing in alignment with said aperture in said casing,

an x-ray beam limiting and shielding liner disposed in said tubular member, said liner having a hollow conical interior and base and apex ends in which there are axial openings, respectively, the apex end extending into said recess around said aperture and being in fluid and radiation



impermeable sealing relationship with said shielding casing and said opening in the apex end being aligned with said aperture,

an x-ray filter wafer extending across the apex end opening and sealed to the apex end of said liner,

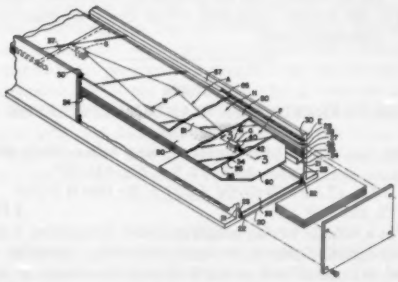
said shielding casing element and said liner being composed of a solidified mixture of resin and barium sulphate.

4,157,477

LIGHT DETECTOR PARTICULARLY ADAPTED FOR DETECTING THE POSITION OF EDGES OF MOVING STRIP

Ronald J. Kall, Brooklyn Heights, and Alan R. Hoffman, Aurora, both of Ohio, assignors to North American Mfg. Co., Cleveland, Ohio

Filed Oct. 11, 1977, Ser. No. 840,901
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—548 **12 Claims**



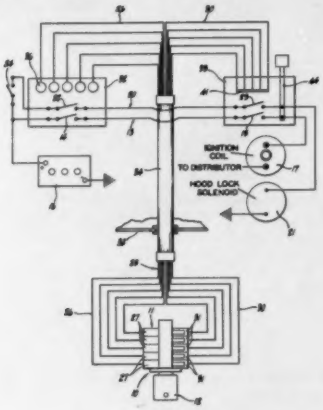
1. In a device for detecting the amount of radiant energy falling on a surface, said device being comprised of a smooth surfaced sheet of translucent material having uniformly dispersed therein a pigment which fluoresces when exposed to exciting radiant energy, at least a portion of the radiant energy from such fluorescence travelling between the surfaces of said sheet to the edges thereof, and photoelectric sensitive means operatively associated with an edge of said sheet for actuation by the radiant energy emitted therefrom to provide an electrical signal which can be amplified, the shape of the surface area of said sheet exposed to the said exciting radiant energy being such as to compensate for the attenuation of the passage of the fluorescent radiant energy through the sheet toward the said photoelectric sensitive means.

4,157,478

AUTOMOBILE THEFT PREVENTION SYSTEM

Richard J. Quinton, 6911 Chippewa St., St. Louis, Mo. 63109

Filed Aug. 15, 1977, Ser. No. 824,633
Int. Cl.[2] H02J *13/00*; B60R *25/04*
U.S. Cl. 307—10 AT **7 Claims**



1. An automobile theft prevention system, including:
(a) an ignition lock including a plurality of cams mounted for individual rotation,
(b) an electrical ignition circuit including a switch means located remotely from the cams for opening and closing the circuit, and
(c) switch-actuating means interconnecting the ignition lock and switch means for closing the circuit when a first set of selected cams are rotated, and for opening the circuit when any one of a second set of selected cams is rotated, the switch-actuating means including:
(1) a first set of flexible push-pull cables connecting the switch means with the first set of selected cams,
(2) a second set of flexible push-pull cables connecting the switch means with the second set of selected cams, and
(3) the flexible push-pull cables being attached to the associated cams.

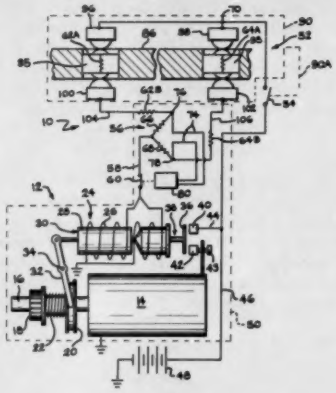
4,157,479

THEFT PREVENTION STARTER SYSTEM FOR A VEHICLE

Stanley S. C. Chan, 1809 McIntyre, Ann Arbor, Mich. 48105

Filed Oct. 25, 1977, Ser. No. 844,707
Int. Cl.[2] B62D *63/04*; H02J *1/00*; H01H *27/06*
U.S. Cl. 307—10 AT **3 Claims**

1. In a vehicle having a starter system comprising a starter motor, a power source, starter switch means operable when closed to connect said power source with said starter motor, and a housing enclosing said starter motor, the improvement comprising a theft-prevention system operable to inhibit the unauthorized actuation of said starter system, said theft prevention system including an auxiliary circuit connectable to said power source comprising at least a pair of separable associated coded portions, a freely transportable element carrying one coded portion, said other coded portion being disposed in said housing, theft-prevention switch means connected to said other coded portion and disposed in said starter housing, said theft-prevention switch means being operable to interrupt the transmission of power from said power source to said starter motor, means for connecting said coded portions, said theft-prevention switch means providing for the transmission of power from said power source to said starter motor only when said associated coded portions of said auxiliary circuit are connected, said theft-prevention switch means and said other coded portion of said auxiliary circuit being disposed in said



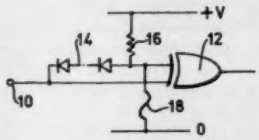
housing to inhibit the unauthorized bypassing of said theft-prevention system.

4,157,480

INVERTERS AND LOGIC GATES EMPLOYING INVERTERS

Colin R. Edwards, Mangotsfield, England, assignor to National Research Development Corporation, London, England

Filed Jul. 22, 1977, Ser. No. 818,223
Claims priority, application United Kingdom, Aug. 3, 1976, 32197/76
Int. Cl.[2] H03K *19/02, 19/22, 19/32*; G11C *17/00*
U.S. Cl. 307—203 **10 Claims**



1. A circuit element having an input, an output, programmable means including a fusible link and providing either a non-inverting signal path between the said input and output or an inverting signal path between said input and said output, one of said signal paths being operative when said link is intact and the other being operative when said link is fused, and programming means responsive to a programming signal to cause fusing of said link.

4,157,481

INTEGRAL CYCLE SWITCH SYNCHRONIZED TO AXIS-CROSSING

John F. Walton, McLean, Va., assignor to Pace, Inc., Silver Spring, Md.

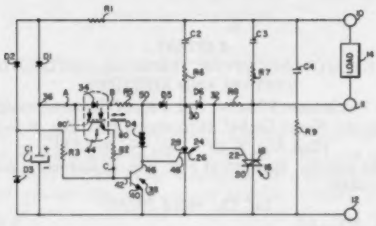
Filed Jul. 19, 1977, Ser. No. 817,050
Int. Cl.[2] H03K *17/72*
U.S. Cl. 307—252 B **25 Claims**

1. A switching circuit for initiating and terminating current flow to an AC-connected load, said current initiation occuring substantially in synchronism with the axis crossing of an AC power source to a preferred voltage polarity from the opposite voltage polarity comprising:
first and second AC line terminals connected to said AC power source, a controlled bidirectional gate device hav-

ing first and second load terminals, means for connecting said load at one end with the second load terminal, means for connecting the other end of said load to the first of said AC line terminals, the first load terminal of said controlled bidirectional gate device being connected to the second of said AC line terminals.

said bidirectional gate device initiating current flow in said load when a voltage potential exists between said first and second load terminals and concurrently a voltage potential exists between the gate electrode of said bidirectional gate device and said second load terminal, the direction of said load current reversing substantially as the polarity of voltage across said AC line terminals reverses;

a first network across said AC power source terminals including a controlled unidirectional gate device, said unidirectional gate device having first and second terminals and a gate electrode, said unidirectional gate device initiating current flow through said first network when said first and second terminals of said unidirectional gate device are forward biased and when concurrently said gate electrode is triggered by a voltage differential with respect to said second terminal of said unidirectional gate device;



circuit means for triggering said unidirectional gate device into conduction, said triggering occurring only when said source voltage is of said opposite polarity;

circuit means for triggering said bidirectional gate device into conduction, only when said unidirectional gate device is conducting, said triggering of said bidirectional gate device occuring substantially when said source voltage crosses into said preferred polarity.

4,157,482

ROTATION DETECTING DEVICE

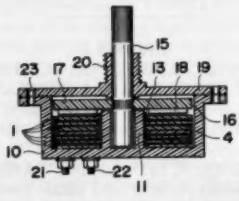
Mikio Kakinuma, Abikoshi, Japan, assignor to Niles Parts Co., Ltd., Japan

Filed Dec. 1, 1977, Ser. No. 856,586

Claims priority, application Japan, Jan. 20, 1977, 52-005660[U]

Int. Cl.² H02K *21/38*

U.S. Cl. 310—155 **5 Claims**



1. A rotation detecting device comprising a housing case, a lid of said housing case, a rotor having a set and a reset permanent magnets and a shaft for rotating said rotor, a disk providing a plurality of wires having Wiegand effect in the radial direction of said disk, coil blocks having an insulating plate mounting spiral coils for producing a pulse current by operation of said wires having Wiegand effect upon the rotation of said rotor, and terminals mounted on said insulating plate of said coil block and extended from a first surface on which said spiral coil is mounted to a second surface opposit to said first surface of said insulating plate for automatically connecting said spiral coils on said coil blocks in series upon assembly of said coil blocks by insertion of said coil blocks into said housing case.

4,157,483

BRUSH MOUNTING FOR DYNAMO-ELECTRIC MACHINE

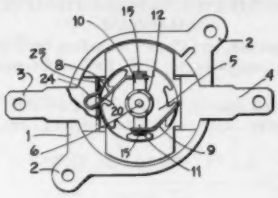
Charles H. Frimley, Windsor, England, assignor to Trico Products Corporation, Buffalo, N.Y.

Filed Feb. 17, 1977, Ser. No. 769,476

Claims priority, application United Kingdom, Feb. 18, 1976, 6277/76

Int. Cl.² H02K *13/00*

U.S. Cl. 310—242 **6 Claims**



1. In a dynamo-electric machine having a rotatable contact; the combination comprising a brush arm of electrically conductive, resilient, flat stock having at one end thereof a looped bight portion and an adjacent end portion bent back towards the bight portion and a brush supported at the other end of the brush arm continuously urged against said rotatable contact in operative position, a terminal adopted to be secured to a power source, the terminal having an opening therethrough with internally disposed opposed edges; the brush arm being replaceably mounted in the opening and by means of said bight portion projecting through said opening in resiliently deformed condition from one side of the terminal and making resilient engagement with opposite edges of said opening and the bent back end portion projecting through the opening from the opposite side of the terminal and lying adjacent thereto whereby the brush arm is retained in position and in electrical contact with said terminal, the brush arm extending freely from said opposite side of the terminal to provide resilient support for the brush thereon against the rotatable contact.

4,157,484

PIP INVERTER TUBE CATHODE HOUSING

Grady K. Stowe, and Lynn E. Paul, both of Dallas, Tex., assignors to Varo, Inc., Garland, Tex.

Filed Feb. 21, 1978, Ser. No. 880,019

Int. Cl.² H01J *39/02*

U.S. Cl. 313—94 **22 Claims**

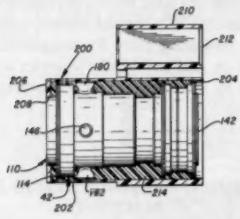
1. A cathode housing for a photocathode internally processed image intensifier inverter tube comprising:

an outer side wall forming a cylindrical opening and a cylindrical cavity for receiving the photocathode of the inverter tube,

a pair of flattened walll surfaces formed in said side wall, the radial distance of said flattened wall surfaces from the center of said cylindrical opening being less than the radius of said cylindrical opening, and

a pair of side arms extending outwardly from said flattened wall surfaces, said side arms being sealingly pinched off at

the ends thereof to maintain a vacuum inside the inverter tube, the radial protrusion of the ends of said side arms



being no greater than the radius of the side walls forming said cylindrical opening.

4,157,485

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP WITH INDIUM-BISMUTH-MERCURY AMALGAM

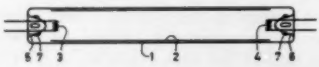
Gustaaf A. Wesselink, and Pieter Hokkeling, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 14, 1976, Ser. No. 695,870

Claims priority, application Netherlands, Jun. 20, 1975, 7507357

Int. Cl.[2] H01J *61/28, 61/72*

U.S. Cl. 313—174 **5 Claims**



1. A low-pressure mercury vapour discharge lamp comprising a sealed glass envelope, two thermally emitting electrodes separated by a discharge space and an amalgam, said electrodes discharge space and amalgam being disposed in said envelope, said amalgam consisting of bismuth, indium and mercury, the ratio of atoms of bismuth to atoms of indium being between 0.4:0.6 and 0.7:0.3 and the ratio of atoms of mercury to the sum of the atoms of bismuth and indium is between 0.01:0.99 and 0.15 ±0.85.

4,157,486

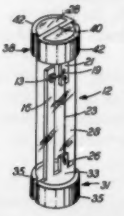
ELECTROLUMINESCENT DISPLAY AND CIRCUIT PROTECTIVE DEVICE AND METHOD OF MAKING

Charles R. Fegley, Laureldale, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 862,253, Dec. 19, 1977, abandoned. This application May 3, 1978, Ser. No. 902,611

Int. Cl.[2] H01J *7/44;* **H01H** *85/32;* **H05B** *33/04, 33/10*

U.S. Cl. 315—71 **31 Claims**



1. An electroluminescent display device, comprising:

at least two conductive leads spaced from each other with a light-emitting element electrically coupled between such leads;

a transparent, insulating base formed about and between the leads and encapsulating the leads and the light-emitting element; and

at least one lateral portion of each lead extending beyond the base and substantially conforming to the configuration of the base.

10. The device of claim **1**, wherein:

each lead has a tab portion bent at a substantially 90°-angle to it; and

the light-emitting element is bonded to one of the tab portions and a conductor is bonded between such element and the other tab portions.

14. The device of claim **10**, wherein a voltage dropping resistor chip is bonded between the light-emitting element and the tab portion of one of the leads.

4,157,487

TELEVISION RECEIVER VERTICAL DEFLECTION SYSTEM AND METHOD

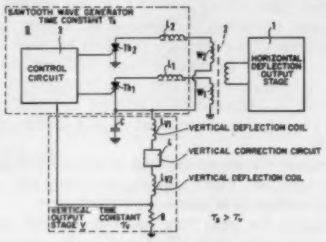
Werner Riechmann, Sibbesse, Fed. Rep. of Germany, assignor to Blaupunkt-Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Aug. 8, 1977, Ser. No. 822,513

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1976, 2638896

Int. Cl.[2] H01J *29/70*

U.S. Cl. 315—393 **9 Claims**



1. In a television receiver,

having means (**1**, **2**) coupling out a portion of the energy delivered by the horizontal deflection circuit during line flyback or retrace;

a vertical deflection output stage (V) including deflection means (L_{V1}, L_{V2}) and a charge capacitor element (C);

and a sawtooth wave generator (S), which controls application of the coupled-out energy derived from the horizontal deflection circuit to the vertical deflection means (L_{V1}, L_{V2}), a method to control vertical deflection

comprising, in accordance with the invention, the step of

additionally controlling application of the energy to the vertical deflection means by the sawtooth wave generator during the vertical flyback or retrace interval by reversely re-charging said capacitor element during said interval.

4,157,488

APPARATUS AND METHOD FOR CONTROLLING A TAPE DRIVE TO MAINTAIN A SUBSTANTIALLY CONSTANT LINEAR TAPE VELOCITY

James C. Allan, Kinnesswood, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

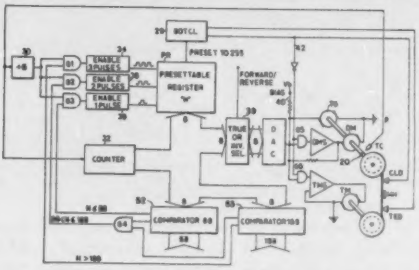
Filed Apr. 5, 1977, Ser. No. 784,766

Int. Cl.[2] B65H *59/38, 77/00;* **H02P** *5/46, 7/68*

U.S. Cl. 318—7 **15 Claims**

1. A tape drive including a drive motor; a take-up reel driven thereby; and a motor speed control system controlling the angular velocity of the drive motor for maintaining a substantially constant linear velocity of the tape as it is wound on the take-up reel, said control system comprising: a turns-counter

counting the turns of tape as each is applied to the take-up reel; a presettable register; presetting means for presetting a predetermined number in said register at the beginning of a tape drive operation when the take-reel is empty of tape; means, responsive to said turns counter, for decrementing the register at a rate, with respect to the rate of application of turns onto the take-up reel, which is initially large during the application of a first predetermined number of turns, and which is subsequently reduced during the application of subsequent turns, to

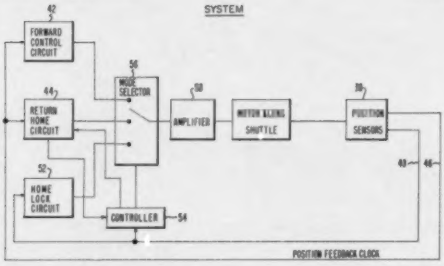


cause the contents of the presettable register to decrease in a non-linear manner with respect to the rate of increase in the number of turns applied to the take-up reel to approximate the non-linear relationship between the angular velocity of the drive motor and the diameter of tape on the take-up reel required to produce a substantially constant linear tape velocity; and motor control means controlling the angular velocity of the drive motor in accordance with the contents of the presettable register.

4,157,489
SERVO CONTROL SYSTEM

Jacob Tal, Salt Lake City, Utah, assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 8, 1977, Ser. No. 804,553
Int. Cl.[2] G05B *1/01*
U.S. Cl. 318—606 **19 Claims**



1. An apparatus for controllably moving a lens system from a first position to a second position in a forward mode to track a moving object field in response to an external reference signal, the external reference signal having a frequency proportional to the velocity of the moving object field, the apparatus further controllably moving the lens system back to said first position in a return mode, said apparatus comprising: a lens system

driving means responsive to the reference signal for moving the lens system out of the first position towards the second position and back to the first position, said driving means including a motor having a rotatable shaft for supplying said moving force, said rotatable shaft rotating with a varying angular return velocity and having a predetermined angular displacement in said second position;

sensing means for sensing the angular displacement of said rotatable shaft by generating a plurality of pulses at predetermined intervals along said angular displacement and at the same predetermined intervals the load moving from the second position to the first position, said plurality of pulses generated in said forward and return mode defining feedback signals having corresponding frequencies;

forward control circuit means responsive to the frequency of each of said reference signal and said feedback signal in said forward mode for providing a forward control signal;

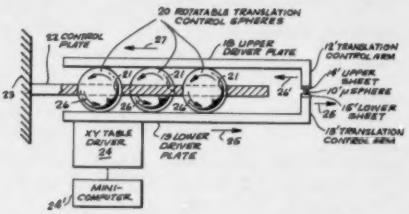
control means responsive to the net number of pulses indicating the angular displacement of the shaft from the first position and responsive to the frequency of said feedback signal in said return mode for providing a return control signal; and

switching means responsive to the passage of the moving object field for supplying said forward control signal to said driving means during said forward mode and said return control signal to said driving means during said forward mode.

4,157,490
X- AND Y-AXIS DRIVER FOR ROTATING MICROSPHERES

Berthold W. Weinstein, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 17, 1978, Ser. No. 906,818
Int. Cl.[2] G05B *19/40*
U.S. Cl. 318—685 **5 Claims**



1. A x- and y-axis driver mechanism for control of the motion and position of a spherical member comprising: a pair of arms, each of said arms being constructed at one end thereof to retain an associated spherical member therebetween, one of said pair of arms being fixedly connected at the opposite end to a first movable driver plate, the other of said pair of arms being fixedly connected at the opposite end to a second movable driver plate spaced from said first driver plate, a fixed control plate positioned intermediate said first and second driver plates and provided with a plurality of apertures therein, a plurality of spheres rotatably positioned in said apertures of said control plate and constructed such that the outer periphery thereof contacts said first and second driver plates, and an x-y table driver operatively connected to said second driver plate, whereby movement of said second driver plate in a horizontal direction by said x-y table driver causes rotation of said plurality of spheres and movement of said first driver plate in an opposite horizontal direction, such that said arms move in opposite directions so as to cause a rolling motion of an associated spherical member retained therebetween.

4,157,491
SPEED CONTROL SYSTEM FOR A UNIVERSAL A-C, D-C MOTOR CONNECTED TO AN A-C NETWORK

Peter Werner, Stuttgart, and Klaus Harsch, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,114
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1976, 2654534
Int. Cl.[2] H02P *5/28*
U.S. Cl. 318—798 **11 Claims**

1. Speed control system for connection to a source of alternating current to control a series motor comprising

a thyristor (16) serially connected into the main power path of the motor (13) and the source (11, 12) and passing half waves from the source of one polarity (positive) when

triggered, while blocking current flow of half waves of the opposite polarity (negative);

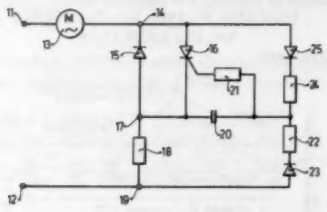
diode means (**15, 30**) connected in parallel with said thyristor and poled oppositely with respect thereto to pass half waves of said other polarity (negative) while blocking half waves of said first polarity (positive);

motor power drawing sensing means (**18**) sensing current flow through the motor during the half wave when said diode means (**15, 30**) is conductive, and deriving a control voltage representative of said current flow;

a capacitor (**20**);

the capacitor being connected to said motor power drawing sensing means (**18**) and storing said control voltage thereon during the half wave when said diode means (**15, 30**) is conductive;

a charge circuit (**24, 25**) connected to the a-c source (**11, 12**) for the capacitor including a charging diode (**25**) therein poled oppositely to the diode means (**15, 30**) in the motor circuit and charging the capacitor when current flows through the motor through said diode means;



said capacitor (**20**) being connected to the gate electrode of the thyristor (**16**) to control firing thereof as a function of the charge on the capacitor;

firing of the thyristor being thus controlled as a function of the current through the motor and hence of said control voltage during the half wave of opposite polarity (negative) and further during occurrence of the half wave of said one polarity (positive), firing occuring earlier in the next half wave of said one polarity when the current drawn by the motor during said half wave of opposite polarity (negative) rises as an indication of loading on the motor, and hence to provide more power to the motor during at least a portion of said half wave of said one polarity (positive),

the motor power drawing sensing means (**18**) being dimensioned to provide a control voltage to the capacitor (**20**) insufficient to trigger said thyristor under essentially no-load conditions, so that the thyristor will block application of power to the motor during the half wave of said one polarity (positive) if the power drawing sensing means provides a control voltage indicative of practically no-load operation of the motor.

4,157,492

BATTERY ACCESS SYSTEM

Nick P. Colbrese, 1840 W. 187th St., Homewood, Ill. 60430

Filed Jul. 20, 1977, Ser. No. 817,166
Int. Cl.[2] H02G *3/00*
U.S. Cl. 320—25 **17 Claims**

1. An improved battery access system comprising:

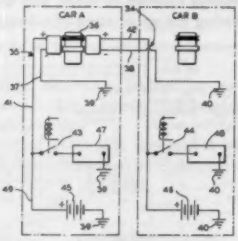
electrical cable conducting means for conducting an electric current;

terminal attachment means affixed to a first end of said electrical cable conducting means for connection of said access system into a first vehicle's electrical system;

integrated coupling plug means affixed at a second end of said electrical cable conducting means for electrically connecting said first vehicle's electrical system into a second electrical system external to that of said first vehicle;

said integrated coupling plug means having a plurality of conducting members associated therewith;

plug connection means which slideable accommodates the conducting members of said integrated coupling plug means of said first vehicle and which simultaneously slideably accommodates conducting members of external coupling plug means from said external electrical system



thereby connecting the electrical conducting members of said external electrical system with the electrical conducting members of said first vehicle;

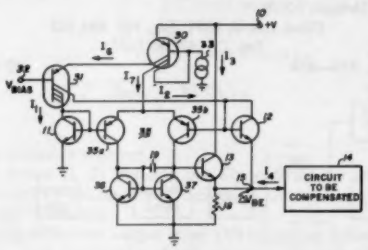
a portion of said electrical cable conducting means capable of being removeable from either said first vehicle or said external system to permit said simultaneous connection of said conducting means into said plug connection means.

4,157,493

DELTA V_{BE} GENERATOR CIRCUIT

Dennis M. Monticelli, Fremont, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Sep. 2, 1977, Ser. No. 830,289
Int. Cl.[2] G05F *1/58*
U.S. Cl. 323—9 **5 Claims**



1. A circuit for generating a compensating potential that is small with respect to a V_{BE} potential of an "on" transistor and is linearly proportional to absolute temperature, said circuit comprising:

a first branch including first diode means coupled in series with means for developing said compensating potential and first current supply means;

a second branch including second diode means coupled in series with second current supply means;

said first and second current supply means being operated in conjunction with said first and second diode means to establish a predetermined current density ratio in said first and second diode means with said second diode means operating at a higher current density;

means for coupling said first branch to said second branch to force the potential developed across said second diode means to equal the potential developed across the series combination of said first diode means and said means for developing said compensating potential; and

amplifier means having an input coupled to said second branch and an output coupled directly to said means for developing said compensating potential, said amplifier means being operated in a negative feedback mode to force said compensating potential to equal the difference

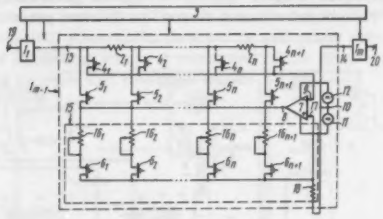
in potential between said first and second diode means whereby said predetermined current density ratio is maintained constant.

4,157,494

CONTROLLED MULTIDIGIT RESISTANCE BOX

Marat I. Kornienko, ulitsa Dugina, 10, kv. 66; Anatoly V. Furman, ulitsa Chkalova, 21, kv. 6; Boris P. Podboronov, ulitsa Molodezhnaya, 30, kv. 50, and Vyacheslav V. Shevchuk, ulitsa Stroitelei, 6, kv. 1, all of Zhukovsky Moskovskoi oblasti, U.S.S.R.

Filed May 22, 1978, Ser. No. 907,917
Int. Cl.[2] H03H *7/38*
U.S. Cl. 323—79 **3 Claims**



1. A controlled multidigit resistance box comprising:
a plurality of digits; each of said digits comprising, in turn:
"n" series-connected resistors, each having two leads;
an operational amplifier having an inverting input, a non-inverting input, and an output;
"n+1" pairs of switching elements, each pair switching one of said leads of said "n" resistors;
the first switching element of each pair being connected to one of said leads of a respective resistor and to said inverting input of said operational amplifier; the second switching element of each pair being connected to the second lead of the respective resistor and to said output of said operational amplifier;
power sources of said operational amplifier, interconnected so that they have a center tap;
a control unit for selecting a desired combination of said resistors;
said control unit being connected to said switching elements;
said center tap of said power sources of the operational amplifier of the previous digit being connected to the input of the next digit of the resistance box.

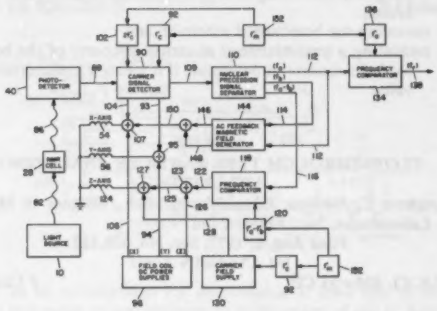
4,157,495

NUCLEAR MAGNETIC RESONANCE GYRO

Bruce C. Grover, Thousand Oaks; Edward Kanegsberg, Pacific Palisades; John G. Mark, Pasadena, and Roger L. Meyer, Canoga Park, all of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Continuation of Ser. No. 714,978, Aug. 14, 1976, abandoned.
This application Oct. 14, 1977, Ser. No. 842,368
Int. Cl.[2] G01R *33/08*
U.S. Cl. 324—0.5 F **66 Claims**

1. A nuclear magnetic resonance detection device comprising:
a nuclear magnetic resonance cell;
a gas vapor of an optically pumpable substance that possesses a magnetic moment and is capable of being optically pumped, said optically pumpable substance being contained in said cell;
at least one nuclear moment gas each having a nuclear magnetic moment also contained in said cell, the nuclear magnetic moments of each said nuclear moment gas being at least partially aligned;
means for applying a steady magnetic field to said cell;
first means for illuminating said cell with optical pumping light capable of partially aligning the magnetic moments of said optically pumpable substance in one direction by absorption of said light;
means for precessing said aligned nuclear magnetic moments of each said nuclear moment gas about the direction of the steady magnetic field at the respective Larmor precession frequencies of each said gas;
means for applying an AC carrier magnetic field to the cell;
second means of illuminating said cell with detection light of a wavelength approximately equal to a wavelength which can be absorbed by the optically pumpable substance;
means for applying said detection light with a directional component orthogonal to the direction of said AC carrier magnetic field to produce modulations in the intensity of the transmitted part of said detection light substantially at



the frequency of at least one harmonic, including the fundamental of said AC carrier magnetic field thereof;
means for detecting at least one of said modulations in the intensity of the transmitted part of said detection light; and
means for electrically demodulating said detected light intensity modulations to obtain a signal varying at the Larmor precession frequency of each said nuclear moment gas and with amplitude proportional to the degree of alignment of said nuclear magnetic moments of each said gas.

4,157,496

CIRCUIT FOR TESTING PROTECTION DEVICES

Guy St-Jean, 324 Whimbey, St-Lambert, Quebec, Canada (J4R 2A3)

Filed Nov. 21, 1977, Ser. No. 853,209
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—28 R **22 Claims**

1. A test generator for simulating operating conditions of a protection device useful in low, high or very high voltage power systems, comprising a single voltage source; a voltage branch connected to said protection device for producing a sparkover voltage across the terminals of said device; an injection branch, including said single voltage source, mounted in parallel with said voltage branch for generating across the protection device a follow current of a value corresponding to the value of the current injected by the said power system in said protection device when the latter is on duty; and a resonant branch operatively connected to said injection branch for producing across the terminals of the protection device under test an alternating voltage corresponding to the voltage of said power system, said resonant branch being set into operation at a time not exceeding interruption of said follow current.

4,157,497

QUALIFICATION TEST OF GALLIUM ARSENIDE

Fred H. Eisen, Woodland Hills; Ricardo Zucca, and Bryant Welch, both of Thousand Oaks, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 5, 1978, Ser. No. 866,975
Int. Cl.[2] G01R *27/02*
U.S. Cl. 324—62 **7 Claims**

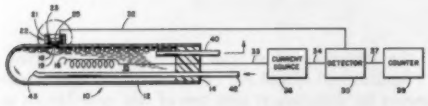
1. A method of qualifying GaAs semi-insulating substrate for ion implantation comprising the steps of:
providing a semi-insulating, GaAs substrate;
bombarding said substrate with inert gas ions selected from the group consisting of krypton, helium, argon, neon, and xenon;
annealing the bombarded substrate; and
measuring a predetermined electrical property of the bombarded substrate to determine if it meets a predetermined value.

4,157,498

FLOW-THROUGH TYPE PARTICLE ANALYZING APPARATUS

Leighton C. Johnson, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 1, 1977, Ser. No. 820,412
Int. Cl.[2] G01N *27/07*
U.S. Cl. 324—71 CP **5 Claims**



1. Flow-through type particle analyzing apparatus comprising in combination:
means for containing an electrolyte, said means including a wall portion provided with an orifice,
first electrode means formed into a configuration for holding between about 150 and about 300 milliliters of sample liquid suspension, said first electrode means being integral with said electrolyte containing means and positioned in registration with said orifice, said electrode arrangement minimizing the sample volume required and minimizing the flow path of aperture current to decrease electrical noise,
a second electrode positioned within said electrolyte containing means and in electrical contact with the electrolyte therein, and
means for inducing flow of sample suspension from said first electrode means through said orifice into said electrolyte containing means.

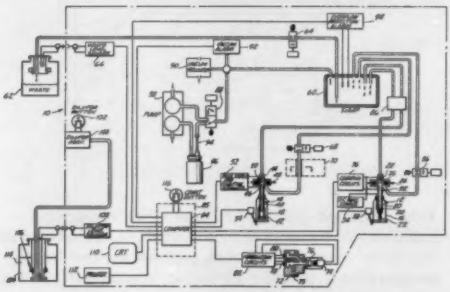
4,157,499

BLOOD CELL COUNTER HAVING DUAL TESTING HEADS

John Kacerek, West Caldwell, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.

Filed Sep. 15, 1977, Ser. No. 833,560
Int. Cl.[2] G01N *27/00*
U.S. Cl. 324—71 CP **16 Claims**

1. A semi-automatic instrument for analyzing prediluted blood samples, said instrument having at least two independent heads and associated circuitry for simultaneously determining red blood cell and white blood cell counts, comprising:
a. a red blood cell counting (RBC) head having at least two electrodes therein, and an RBC aperture between at least two of the electrodes, means for receiving and releasably coupling with a first reservoir containing a first conductive liquid dilution having a blood sample with red blood cells and diluent in predetermined ratio for (RBC) counting;
b. an RBC conduit for passing the first conductive liquid dilution containing red blood cells past the electrodes and through the RBC aperture, said RBC conduit extending into a reservoir containing the red blood cell dilution;
c. means for applying an electrical signal through the aperture;
d. RBC circuitry for producing pulses as cells suspended in the first dilution pass through the red blood cell aperture, said RBC circuitry being connected to electrodes located on opposite sides of the aperture;
e. a white blood cell counting (WBC) head having at least two electrodes therein and a WBC aperture between at least two of said electrodes, means for receiving and releasably coupling a second reservoir containing a second conductive liquid dilution having the blood sample with white blood cells and diluent in a different predetermined



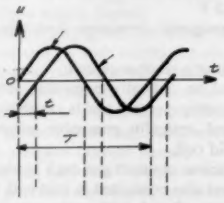
ratio for (WBC) counting; f. a WBC conduit for passing the second conductive liquid dilution containing white blood cells past the electrode and through the WBC aperture, said WBC conduit extending into a reservoir containing the white blood cell dilution;
g. means for applying an electrical signal through the WBC aperture;
h. WBC circuitry for producing pulses as cell suspended in the second dilution pass through the WBC aperture, said WBC circuitry being connected to electrodes located on opposite sides of the aperture;
i. means for detecting the pulses produced in both heads and for providing output indications corresponding to the number of particles pass through the apertures, respectively.

4,157,500

MULTIPERIODICAL PHASEMETER

Jacques A. G. Nicoli, Paris, France, assignor to Societe d'Exploitation de Produits et de Techniques pour l'Aeronautique & l'Automatique, France

Filed Oct. 31, 1977, Ser. No. 846,789
Int. Cl.[2] G01R *25/00*
U.S. Cl. 324—83 R **5 Claims**



1. A multi-period phasemeter for measuring the phase difference between two input signals, comprising:
means including a single period phase detector for providing a rectangular wave signal having a pulse width that varies from a first value to a second value in accordance with the instantaneous phase difference between said two input

signals, said pulse width varying from said first value to said second value each time said phase difference is shifted by 360°;

means coupled to said phase detector for receiving and integrating said rectangular wave signal and providing a signal representative of the average value of said rectangular wave signal;

means coupled to said integrating means for receiving and differentiating said average value representative signal and providing a differentiated signal having first and second polarity portions representative of the slopes of said differentiated signal; and

means including an up-down counter for providing a signal representative of the difference in number of plus 360° and minus 360° phase shifts detected by said phase detector, said difference being representative of the phase difference between said two input signals.

4,157,501

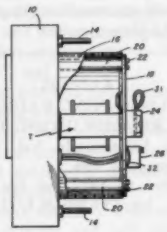
DIGITAL PANEL METER

Ralph E. Cain, Jr., Mansfield, and Thomas J. Crowell, Dedham, both of Mass., assignors to R. T. Engineering Service Inc., Mansfield, Mass.

Filed Jan. 23, 1978, Ser. No. 871,202

Int. Cl.² G01R *15/12, 19/22, 1/30*

U.S. Cl. 324—115 **11 Claims**



1. A digital panel meter comprising;

a housing,

input terminal means for receiving AC and DC input signals,

range circuit means including means responsive to the output of the input terminal means and means for selecting one of a plurality of different amplitude ranges,

amplifier means responsive to the output of the range circuit means and having an output,

rectifier means responsive to the output of the amplifier means for passing signals of only one polarity while substantially blocking signals of the opposite polarity,

filter means responsive to the output of the rectifier means,

analog to digital converter means responsive to the output of the filter means and including display means mounted in the housing,

means for providing operating power for at least said amplifier means and converter means including a transformer and rectifier circuit,

a mounting plate at the rear of the housing,

means supporting the mounting plate from the rear of the housing to define a space between the housing and mounting plate,

said transformer being disposed in said space,

and a terminal strip also at the rear of the housing including terminals forming the input terminal means and AC power terminals.

4,157,502

ARRANGEMENT FOR DETERMINING THE EFFECTIVE VALUE AND/OR THE POWER OF ELECTRICAL SIGNALS

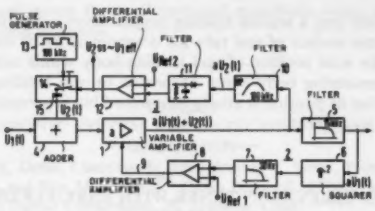
Dieter Hassler, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Division of Ser. No. 614,333, Sep. 17, 1975, Pat. No. 4,060,763. This application Jul. 27, 1977, Ser. No. 819,623

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1974, 2444626

Int. Cl.² G01R *1/30, 17/06*

U.S. Cl. 324—123 R **9 Claims**



1. In an arrangement for determining at least one of the effective value, power intensity or cross power of one or more input electrical signals, such as Doppler signals received in ultrasonic-Doppler blood flow measurement, comprising at least one variable amplifier having a controllable amplification control circuit for regulating the degree of amplification of said variable amplifier, so as to produce a constant amplifier output power, said variable amplifier being connected to said control circuit, the arrangement further comprising a measuring circuit connected to said variable amplifier for determining the adjusted degree of amplification of the variable amplifier at said constant amplifier output power, said measuring circuit comprising: means for producing an auxiliary measuring signal; means for supplying said auxiliary measuring signal together with an input electrical signal into said variable amplifier, and means connected with the output of said variable amplifier for deriving an amplified auxiliary measuring signal from the amplified electrical signals at the output of said variable amplifier; and regulating means in said measuring circuit for regulating the amplitude of the auxiliary measuring signal in an inverse proportionality to the degree of amplification of said variable amplifier, the producing means of the measuring circuit comprising: a chopper switch for generating said auxiliary measuring signal, said chopper switch converting the output signal of said regulating means into an amplitude-proportional direct current-free square-wave oscillation, means connected with said variable amplifier for alternately supplying said direct current-free square-wave oscillation and a lower-frequencied input electrical signal to said variable amplifier.

4,157,503

APPARATUS AND METHOD FOR TESTING THE THICKNESS OF THE WALL OF A MOVING TUBE LEAVING AN EXTRUDER

Mathias Brunner, Twann, Switzerland, assignor to Zumbach Electronic AG, Orpund, Switzerland

Filed Mar. 21, 1977, Ser. No. 779,781

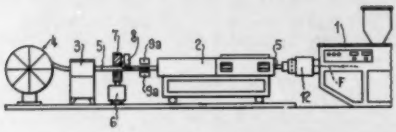
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612993

Int. Cl.² G01R *33/12*

U.S. Cl. 324—231 **21 Claims**

1. An apparatus for testing the wall thickness of a moving tube electrically non-conducting material produced by an extruder, comprising a measuring body and a first holding magnet approached towards the tube wall from outside for radially pulling said measuring body into contact with the inner surface of the tube wall, a measuring sensor approached

towards the outer surface of said tube near said first holding magnet, said measuring sensor being influenced by said measuring body in accordance with the mutual distance between measuring sensor and measuring body, this distance being determined by the wall thickness, a holding body upstream said measuring body with reference to the moving direction of



said tube and a second holding magnet approached towards the outer surface of said tube for determining by its magnetic pull the axial position of said holding body within said tube, said measuring body being connected to said holding body such that its position is axially determined but is permitted free radial movement.

4,157,504

VHF TELEVISION TUNER WITH EASY/FLEXIBLE ACCESS

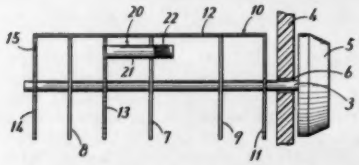
Katsuo Ito; Bunjiro Murata, both of Kanazawa; Yoji Maeda, Ishikawa; Kazunori Yoshimura, and Eiichi Hibino, both of Kanazawa, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 22, 1977, Ser. No. 780,109

Claims priority, application Japan, Jan. 18, 1977, 52-5170[U]; Jan. 18, 1977, 52-5171[U]

Int. Cl.[2] H04B 1/06

U.S. Cl. 325—464 **15 Claims**



1. A VHF television tuner for selection of a television signal through mechanical switching selection of a radio frequency inductance coil and a corresponding oscillation frequency inductance coil, comprising

a tuner casing,

mechanical switching selection means provided in said casing and including a rotatably mounted channel selection shaft having a given axis of rotation, said mechanical switching selection means being responsive to operator selection of a desired radio frequency signal for selecting corresponding said radio frequency inductance coil and corresponding said oscillation frequency inductance coil by rotation of said shaft,

radio frequency amplifying means operatively coupled to the selected radio frequency inductance coil for selectively amplifying said desired radio frequency signal,

local oscillating means operatively coupled to said selected oscillation frequency inductance coil for providing a local oscillation frequency signal having a frequency which is different by a given frequency difference from said desired radio frequency,

mixing means responsive to said selectively amplified radio frequency signal from said radio frequency amplifying means and said local oscillation frequency signal from said local oscillating means for providing an intermediate frequency signal, and

intermediate frequency tuned circuit means for selectively withdrawing said intermediate frequency signal for broadcast,

said intermediate frequency tuned circuit means comprising an intermediate frequency transformer comprising an intermediate frequency coil having a given axis and inductance value, and adjusting means operatively coupled to said intermediate frequency coil for adjusting the inductance value of said intermediate frequency coil by rotation thereof about said axis of said intermediate frequency coil, said intermediate frequency transformer being provided in said casing such that the axis of said intermediate frequency coil is oriented in a direction substantially parallel to the given axis of rotation of said channel selection shaft,

wherein said intermediate frequency coil comprises a bobbin and a coil wound around said bobbin, and

said adjusting means comprises a magnetic core threadably mounted in said bobbin for allowing thereof about said given axis so as to cause to and fro movement of said magnetic core in the axial direction of said given axis of said intermediate frequency coil,

wherein said tuner casing has a front end and a rear end, said adjusting means being adapted to be accessible from at least one of the front and rear ends of the tuner, said casing being discontinuous so as to define an aperture at said at least one of the front and rear ends thereof at a position in alignment with said given axis of said intermediate frequency coil for allowing access to said intermediate frequency transformer from outside of said at least one of the front and rear ends of said casing for adjustment of the inductance value of said intermediate frequency coil,

said tuner further comprising a plate member provided extending in a direction substantially perpendicular to the direction of said given axis of said channel selection shaft, and wherein said intermediate frequency transformer is mounted on said plate member.

4,157,505

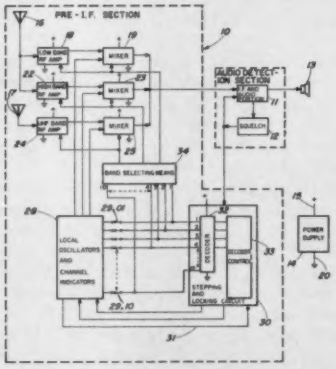
PLURAL BAND SCANNING RADIO WITH DIRECT SWITCH OF RF AMPLIFYING TRANSISTORS

Kenneth R. Owens, Indianapolis, Ind., assignor to Regency Electronics, Indianapolis, Ind.

Filed Jun. 13, 1977, Ser. No. 805,839

Int. Cl.[2] H04B 1/32

U.S. Cl. 325—470 **19 Claims**



1. In a stepping radio receiver for production of audio signals from radio frequency signals and capable of tuning to several separate channels on a plurality of bands, which radio receiver includes:

(a) a pre-IF section having an RF signal-receiving means, mixing means, and an oscillator means;

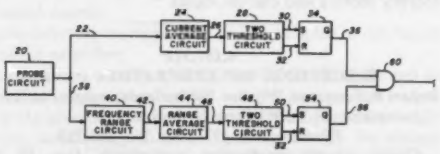
(b) said pre-IF section being operable on a plurality of distinctive bands;

(c) a power supply having a first and second common supply lead;
(d) said RF signal-receiving means being for providing sufficient RF signal level for said mixing means;
(e) said mixing means being coupled to the RF signal receiving means;
(f) an audio detection means coupled to said mixer means for producing an audio signal when an RF signal is being received, said audio detection means including squelch means for preventing the production of an audio signal when an RF signal is not being received;
(g) said oscillator means being coupled to said mixer means and operable at a given several frequencies, there being one frequency for each channel to which the receiver can tune;
(h) stepping means which is defeatable and which has several outputs which are coupled to said oscillator means for stepping said oscillator means through said given several frequencies;
(i) locking means which is connected to the stepping means for defeating said stepping means as long as an RF signal is being received and allowing resumption of operation of said stepping means when no signal is being received;
(j) a programmable band-selecting means connected to the pre-IF section of the receiver and to the stepping means for determining the band of operation of the receiver;
(k) said programmable band-selecting means including a plurality of enabling means, each enabling means being for enabling operation on one of the bands; the improvement which comprises:
(l) said pre-IF section including a plurality of switchable transistor amplifiers which amplify pre-IF, RF signals, there being at least one of said switchable transistor amplifiers associated with each band;
(m) said stepping means having means for producing a low impedance to said first common supply lead for the output which is "ON" and a high impedance or voltage with respect to said first common supply lead for the outputs which are "OFF", and
(n) means connected with said programmable band-selecting means for providing a current path for one of said switchable transistor amplifiers which passes through the low impedance output of said stepping means, the selection of said one of said switchable transistor amplifiers being made by said programmable band-selecting means, said current path having the same current through both the stepping means outputs and said switchable transistor amplifiers.

4,157,506
FLAME DETECTOR

John D. Spencer, Ottawa, Canada, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 1, 1977, Ser. No. 856,444
Int. Cl.[2] H04B *17/14*; G08B *21/00*
U.S. Cl. 328—6 **24 Claims**

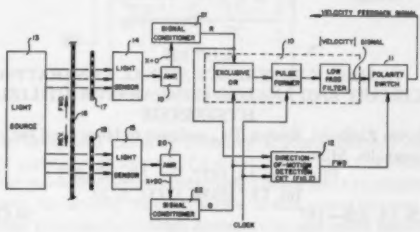


1. In a flame-sensing method in which a sensor signal is produced by monitoring, with an appropriate sensor, a region in which flame is to be detected, a method of detecting the absence of flame in the region, comprising:
a. setting a binary range indication to a first logic level when the sensor signal comes within a first predetermined frequency range;
b. setting the binary range indication to a second logic level when the sensor signal leaves a second predetermined frequency range that includes the first predetermined frequency range;
c. producing an average signal representative of the average analog value of the binary range indication, the first logic level in the binary range indication thereby influencing the average signal in a first direction, and the second logic level in the binary range indication thereby influencing the average signal in a second direction;
d. setting a binary frequency indication to indicate the possible presence of flame when the average signal leaves a predetermined magnitude range in the first direction; and
e. setting the binary frequency indication to indicate the absence of flame when the magnitude of the average signal leaves the predetermined magnitude range in the second direction.

4,157,507
ELECTRONIC SYSTEM FOR DETECTING DIRECTION OF MOTION

Ashok K. Desai, Chatsworth; Bipinchandra V. Gami, Woodland Hills, and Eric M. Dunstan, Hidden Hills, all of Calif., assignors to Pertec Corporation, El Segundo, Calif.

Continuation of Ser. No. 795,100, May 9, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,405
Int. Cl.[2] G01R *19/14*; H03K *5/20*
U.S. Cl. 328—134 **3 Claims**



1. An electronic system for determining the direction of motion operating on two alternating signals from position transducers spatially displaced 90°, comprising

separate means for converting each of the alternating signals into logic signals of one voltage level for each half cycle of one polarity and of another voltage level for each half cycle of opposite polarity, thereby producing a squarewave reference signal, R, from one alternating signal and a squarewave quadrature signal, Q, from the other alternating signal, said quadrature signal being +90° or −90° out of phase with the reference signal depending upon the direction of motion being sensed by said transducer,

circuit means responsive to said quadrature signal for producing a pulse, P, at each signal level transition of a given polarity and a pulse, N, at each signal level transition of opposite polarity,

logic means responsive to said reference signal R and to said pulses P and N to produce a forward signal, FWDPLS, for one quadrature phase relationship of the logic signals R and Q according to the logic function

$$FWDPLS = RP + RN$$

logic means responsive to said reference signal R and to the pulses P and N to produce a reverse signal, REVPLS, for another quadrature phase relationship of the logic signals R and Q according to the logic function

$$REVPLS = RN + RP.$$

4,157,508

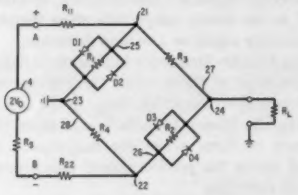
SIGNAL CUBER CIRCUIT

Rudolf P. Hecken, Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 21, 1977, Ser. No. 853,333

Int. Cl.[2] H03H *7/04*

U.S. Cl. 328—142 **4 Claims**



1. A cuber circuit comprising:

a resistive bridge network (**10**) having four nodes (**21, 22, 23, 24**);

a first pair of oppositely-disposed nodes (**21, 22**) constituting the input terminals of said circuit;

a second pair of oppositely-disposed nodes (**23, 24**) constituting the output terminals of said circuit;

characterized in that:

a pair of oppositely-poled diodes (**D1, D2 and D3, D4**) is connected in parallel with the resistor (R_1, R_3) in each branch (**25, 26**) of one pair of opposite branches of said bridge.

4,157,509

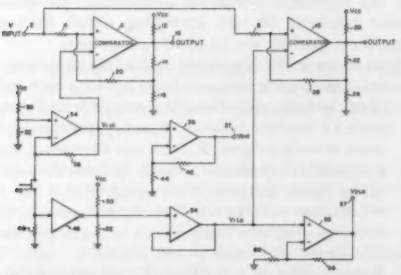
VARIABLE REFERENCE SIGNAL GENERATING CIRCUIT AND ANALOG COMPARATOR UTILIZING HYSTERESIS

Martin Zielinski, Roslyn, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 13, 1977, Ser. No. 806,077

Int. Cl.[2] H03K *5/153, 5/20*

U.S. Cl. 328—147 **10 Claims**



1. A signal comparator comprising

a first signal comparator means having hysteresis,

a second signal comparator means having hysteresis, said first and said second signal comparators each comparing an input signal with a reference signal to produce an output signal level representative of the relative magnitude between the compared signals,

input signal means for connecting a first input of each of said comparator means to a source of an input signal to be compared,

first reference signal generating means for generating a first reference signal level in a first mode of operation and a second reference signal level in a second mode of operation,

first circuit means for connecting an output from said first reference signal generating means to a reference signal input of said first comparator means,

second reference signal generating means for generating a first reference signal in a first mode of operation and a second reference signal in a second mode of operation,

second circuit means for connecting an output of said second reference signal generating means to a reference signal input of said second comparator means, and

control means for concurrently and selectively operating said first signal generating means and said second signal generating means in said first mode of operation and said first signal generating means and said second signal generating means in said second mode of operation.

4,157,510

ELECTRONIC INSTRUMENT AMPLIFIER

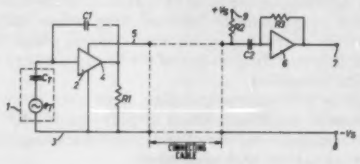
Donald J. Birchall, c/o D. J. Birchall Limited, Finchley Ave., Industrial Estate, Mildenhall, Suffolk, England

Filed Nov. 18, 1977, Ser. No. 852,967

Claims priority, application United Kingdom, Nov. 18, 1976, 48214/76

Int. Cl.[2] H03F *3/60*

U.S. Cl. 330—53 **5 Claims**



1. An electronic instrument amplifier for amplifying the output from a piezo-electric ceramic transducer comprising: a charge/current converter local to the transducer having an amplifier means having input and output terminals and first and second voltage supply terminals, a load resistor connected between said output terminal and said first voltage supply terminal and a feedback capacitor connected between said output terminal and said input terminal; means for connecting the piezo-electric ceramic transducer between the input terminal of said amplifier means and said first voltage supply terminal, whereby said charge/current converter converts the charge output of the transducer into a current signal at said second voltage supply terminal having a magnitude directly proportional to the charge output of the transducer; a two-conductor electrical cable connected to respective voltage supply terminals to said amplifier means; and a current/voltage converter connected to said two-conductor electrical cable for converting the current output of said charge/current converter into a voltage signal whose magnitude is proportional to the magnitude of said current signal having an input terminal capacitively connected to that conductor of said electric cable which is connected to said second voltage supply terminal to thereby receive said current signal.

4,157,511

ELECTRONIC REVERBERATION DEVICE

Robert R. Laupman, Wijchen, Netherlands, assignor to Novanex Automation N.V., Wijchen, Netherlands

Filed Dec. 16, 1977, Ser. No. 861,283

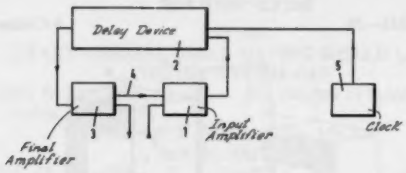
Claims priority, application Netherlands, Dec. 17, 1976, 7614040

Int. Cl.[2] H03F *1/36*

U.S. Cl. 330—107 **4 Claims**

1. An electronic reverberation device comprising an input amplifier having an input and an output, an output amplifier having an input and an output, a delay device connected between said output of said input amplifier and said input of said output amplifier, a feedback path connected between said

output of said output amplifier and said input of said input amplifier, said delay device being a variable delay line, a regulator for regulating the delay of said delay device and having a control input, and a control device between said output of



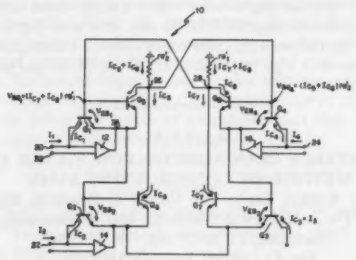
said input amplifier and said control input of said regulator, said control device controlling said regulator such that the sum of the signal from said delay device and re-supplied to said input amplifier through said feedback path and the input signal of said input amplifier is substantially frequency-independent.

4,157,512

ELECTRONIC CIRCUITRY HAVING TRANSISTOR FEEDBACKS AND LEAD NETWORKS COMPENSATION

James C. Schmoock, San Jose, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 7, 1978, Ser. No. 894,290
Int. Cl.[2] H03F 3/45; G06G 7/16
U.S. Cl. 330—260 **7 Claims**



1. An electronic circuit, comprising:

(a) an amplifier having an inut adapted for coupling to a signal source;

(b) an inverting current source serially coupled to the output of the amplifier;

(c) a feedback transistor having a collector electrode and an emitter electrode connected in series between the output of the inverting current source and the input of the amplifier, substantially all current passing through the emitter and collector electrodes of the feedback transistor also passing through the inverting current source;

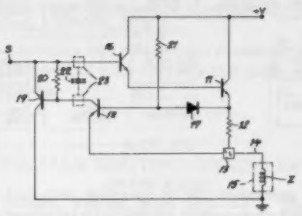
(d) a lead network means, including the amplifier and a capacitor connected in parallel with the amplifier, such lead network means being connected in series between both the inverting current source and the emitter and collector electrodes of the transistor to provide a series compensation network for stabilizing the electronic circuit.

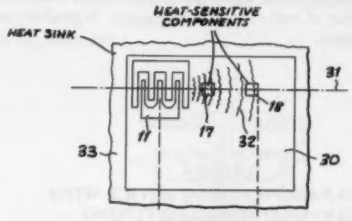
4,157,513

PROTECTIVE SYSTEM FOR POWER STAGE OF MONOLITHIC CIRCUITRY

Giovanni Ghiringhelli, Segrate, and Bruno Murari, Monza, both of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Agrate Brianza, Milan, Italy

Filed Dec. 20, 1977, Ser. No. 862,355
Claims priority, application Italy, Dec. 21, 1976, 30659 A/76
Int. Cl.[2] H03F 3/04
U.S. Cl. 330—298 **4 Claims**





1. In integrated circuitry including a power element connected across a load by way of a series resistor, and a normally inactive protective circuit comprising a diode and a monitoring transistor for limiting the current flow in said power element in response to excessive voltage drops across said series resistor, said monitoring transistor having a base and an emitter connected in bucking relationship with said diode across said series resistor.

the improvement wherein said diode and said monitoring transistor are disposed at different distances from said power element for consecutively receiving a thermal wave emanating from said power element in an overheating condition thereof, said diode being connected to reduce the sensitivity of said protective circuit in response to said thermal wave whereas said monitoring transistor is connected to increase said sensitivity upon being struck by said thermal wave whereby only overloads lasting for periods at least equal to the transit time of the thermal wave between said components are fully effective to limit said current flow.

4,157,514

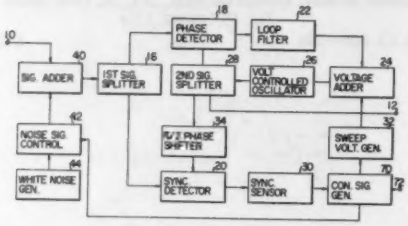
SYNCHRONIZING SIGNAL GENERATOR

Yushi Naito; Yoichi Moritani, and Yoshinori Uchida, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,086
Claims priority, application Japan, May 31, 1977, 52/64185
Int. Cl.[2] H03B 3/04
U.S. Cl. 331—4 **4 Claims**

1. A synchronizing signal generator having applied thereto an incoming signal including the object signal and a plurality of noise signals dispersedly located in a frequency band adjacent to said object signal to generate a synchronizing signal phase synchronized with said object signal wherein there are pro-

vided a white noise generator for generating white noise in said frequency range, a noise signal generation circuit responsive to a suppression signal applied thereto to attenuate controllably said white noise, a composition circuit for composing a signal of said incoming signal and said controllably attenuated white noise from said noise signal generation circuit, and a synchro-



nizing signal generation circuit operative with said composite signal from said composition circuit to be selectively synchronized with a signal included in said composite signal and having a stabilized phase thereby to generate said synchronizing signal, said synchronizing signal generation circuit responding to the generation of said synchronizing signal to produce said suppression signal.

4,157,515

BAND-PASS FILTERING DEVICE WITH SERVO-CONTROLLED TUNING

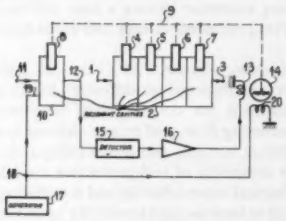
Pierre de Bayser, and Pierre Mondoloni, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 23, 1978, Ser. No. 871,799

Claims priority, application France, Jan. 28, 1976, 77 02451

Int. Cl.[2] **H03H** *7/10;* **H01P** *1/20*

U.S. Cl. 333—17 R **3 Claims**



1. A band-pass filtering device comprising n cells, n being a positive integer, each of them having a mechanical tuning control, said n cells being electrically series connected and simultaneously tunable by means of a single control shaft mechanically coupled to the tuning controls of said n cells, said filtering device further comprising a tuning system including an additional tunable cell having an input and an output, said additional cell being susbstantially identical with said n cells and being tunable by said single shaft, the mechanical tuning control of said additional cell being staggered in relation to those of said n cells so as to provide a predetermined frequency interval between the resonant frequency of said additional cell and said n cells, and said tuning system further comprising a control loop which automatically positions said shaft so that said additional cell is tuned to the frequency of a signal applied to said additional cell input.

4,157,516

WAVE GUIDE TO MICROSTRIP TRANSITION

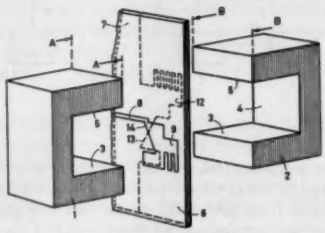
Abram van de Grijp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 1, 1977, Ser. No. 829,619

Claims priority, application Netherlands, Sep. 7, 1976, 7609903

Int. Cl.[2] **H01P** *5/10*

U.S. Cl. 333—26 **6 Claims**



1. A wave guide to microstrip transition comprising a wave guide, a generally planar substrate arranged in said wave guide parallel to the electric field lines and the longitudinal direction of said wave guide, a conductive base plate affixed to one side of said substrate, a first conductor affixed to the other side of said substrate opposite said base plate and defining with said substrate and said base plate a microstrip line, a second conductor affixed to said other side of said substrate and connected to said first conductor at a junction therebetween, said second conductor extending from said junction to a first wall portion of said wave guide and connecting said first conductor to said first wall portion, said base plate having a portion which extends from a point opposite said junction and is connected to a second wall portion of said wave guide, said second wall portion being disposed opposite said first wall portion, said base plate having a further portion which extends from said point to said first wall portion, said further portion and said second conductor each having an edge which extends from said point and said junction, respectively, to said first wall portion and being configured such that said edges define a transmission line which presents a high impedance at the region of said junction and said point.

4,157,517

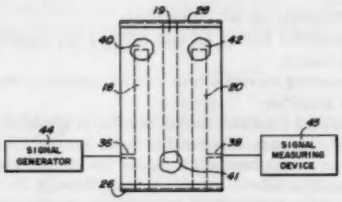
ADJUSTABLE TRANSMISSION LINE FILTER AND METHOD OF CONSTRUCTING SAME

Thomas F. Kneisel, Davie, and Robert L. Benenati, Tamarac, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 19, 1977, Ser. No. 861,784

Int. Cl.[2] **H03H** *9/00;* **H01P** *1/20*

U.S. Cl. 333—205 **11 Claims**



1. A transmission line filter adapted for use at a predetermined frequency, including in combination:

conductor means forming a ground plane;

conducting resonator means spaced from said ground plane conductor means and cooperating therewith to form a transmission line;

said resonator means being of a configuration to provide a

particular loss response characteristic at a frequency spaced from said predetermined frequency; and

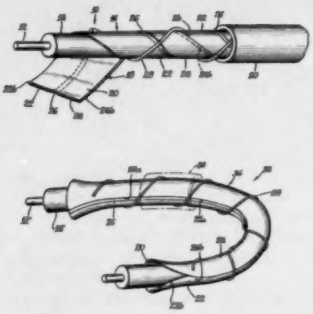
said ground plane conductor means having a portion removed therefrom to provide an opening therein selected to change the electrical parameters of the transmission line to tune the response frequency of the filter to the predetermined frequency.

4,157,518

LEAKY COAXIAL CABLE HAVING SHIELD LAYER WITH UNIFORM GAP

John W. McCarthy, Glen Ellyn, Ill., assignor to Belden Corporation, Geneva, Ill.

Filed Jul. 27, 1977, Ser. No. 819,364
Int. Cl.[2] H01P *3/06*
U.S. Cl. 333—237 **16 Claims**



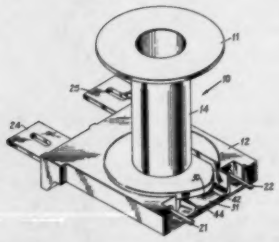
1. A leaky coaxial cable comprising an axial electrical conductor, an insulation layer disposed coaxially along the length of said conductor, and an outer shield layer coaxial with said insulation layer along its longitudinal length, said shield layer including an electrically nonconductive carrier member and at least two electrically conductive elements carried by said carrier member along the longitudinal length thereof, said conductive elements defining outer lateral edges and at least one gap of constant width along the length of said cable intermediate the lateral edges of said carrier member, said carrier member being wrapped about the circumference of said insulation layer along the length of said cable such that the outer lateral edges of said conductive elements overlap.

4,157,519

START LEAD DAMPENERS ON COIL BOBBIN

Jack V. Foster, Fort Branch, Ind., assignor to AMF Incorporated, White Plains, N.Y.

Filed Apr. 13, 1978, Ser. No. 895,896
Int. Cl.[2] H01F *15/10*
U.S. Cl. 336—192 **4 Claims**



1. In a coil bobbin having first and second end flanges and a body portion therebetween upon which a coil is to be wound, and wherein one of the flanges has spaced top and bottom walls that form therebetween a groove or pocket that extends parallel to said walls along the peripheral edge of the flange and extends inwardly from said edge and toward the body portion, said one flange supporting at least first and second spaced terminal means, and wherein one end lead of a coil is to be secured to one of said terminals and passes transversely and inwardly across the groove and exit from the groove adjacent the body portion, the improvement comprising

first and second transversely spaced ribs projecting into said groove from the top and bottom walls, respectively, of said flange, said ribs extending from the region of the peripheral edge of said walls inwardly toward the innermost boundary of the groove,

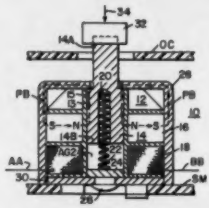
said ribs extending into said groove predetermined distances to restrain an end lead wire of a coil passing transversely thereacross.

4,157,520

MAGNETIC FLUX SHIFTING GROUND FAULT TRIP INDICATOR

Roger D. Moates, Tehran, Iran; Nicholas A. Tomasic, Plum Borough, and Charles W. Leah, Washington Township, Fayette County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 4, 1975, Ser. No. 628,674
Int. Cl.[2] H01F *7/08*
U.S. Cl. 335—230 **2 Claims**



1. A circuit interrupter, comprising:

(a) separable main contacts for interconnecting portions of an electrical line;

(b) a magnetic material support means having a generally cylindrical opening therein;

(c) a generally cylindrical indicating member of magnetic material, said indicating member being disposed in said opening, said indicating member being moved generally longitudinal of said opening from a first longitudinal position to a second longitudinal position on the opening of said contacts;

(d) spring means disposed in cooperating arrangement with said support means and said indicating member for causing said movement of said indicating member from said first position to said second position;

(e) a generally cylindrical permanent magnet having a central opening therein and being disposed on said support means, said indicating member being movable through said central opening, said permanent magnet being disposed to provide a first closed magnetic flux path through said support means and through said indicating member when said indicating member is in said first position for thus latching said indicating member in said first position, said permanent magnet means also providing a second closed magnetic flux path in said support means and said indicating member when said indicating member is in said second position for thus latching said indicating member in said second position;

(f) a generally cylindrical electromagnet having a central opening therein and being disposed on said support means, said indicating member being movable through said central opening, said electromagnet being disposed to provide

opposing magnetic flux in said first closed flux path when said electromagnet is energized, said opposing flux reducing the total magnetic flux in said first path, thus reducing said magnetic latching of said indicating member in said first position, thus allowing said spring member to move said indicating member from said first position to said second position, said indicating member being manually movable to said first position from said second position for reset; and

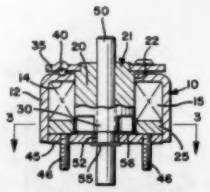
(g) electrical energizing means electrically connected to said electromagnet for providing a pulse of energy to said electromagnet member to thus provide said opposing magnetic flux when said separable main contacts open to thus provide an indication of the provision of said pulse of energy even after said pulse has ended.

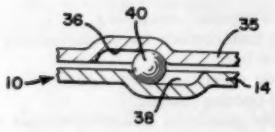
4,157,521

ROTARY SOLENOID

Gerald H. Leland, Dayton, Ohio, assignor to Ledex, Inc., Dayton, Ohio

Filed Jan. 26, 1978, Ser. No. 872,380
Int. Cl.[2] H01F *7/08*
U.S. Cl. 335—272 **3 Claims**





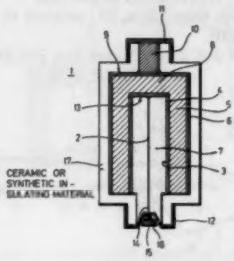
1. A rotary solenoid having a substantially constant-dimension air gap, comprising a generally cup-shaped case of ferromagnetic material having a sleeve portion and having an end portion defining therein an armature receiving opening, an energizing coil received in said case adjacent the inside surface of said end portion, an annular stator member received in said case adjacent said coil having at least one arcuately formed pole member, an armature received in said case having sector-shaped poles corresponding in arcuate spacing and in number to said stator poles, the poles on said armature being positioned radially within the poles on said stator and defining with said stator poles an air gap which remains relatively constant as each armature pole moves past its corresponding stator pole, plate means carried on one end of said armature exteriorly of said case end portion, means in said plate means and said case defining at least one pair of cooperating non-inclined arcuately-extending ball recesses, a ball received in each of said recess pairs, the arcuate extent of said recess pairs defining with said balls the extent of angular rotation of said armature in said case, a shaft on said armature, closure means closing the open end of said case, and bearing means in said closure means rotatably supporting said shaft.

4,157,522

ELECTRICAL MELTING FUSE COMBINED WITH A PELTIER ELEMENT

Burkhard Deter, Ottobrunn, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 848,901
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1976, 2652495
Int. Cl.[2] H01H *85/00*
U.S. Cl. 337—4 **6 Claims**



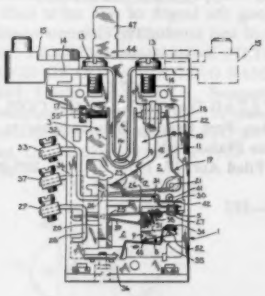
1. An electrical melting fuse, comprising a melting conductor and a Peltier element having surface means which change their temperature in response to a change in the current flow direction through said Peltier element and means electrically connecting said melting conductor in series with said Peltier element, said melting conductor being arranged in intimate heat transfer contact with said surface means of said Peltier element.

4,157,523

BIMETAL OVERLOAD RELAY

Parker A. Bollinger, Jr., Franklin, and Norbert F. Frymark, Glendale, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Division of Ser. No. 715,681, Aug. 19, 1976, Pat. No. 4,069,464. This application Nov. 11, 1977, Ser. No. 850,541
Int. Cl.[2] H01H *71/16*
U.S. Cl. 337—56 **4 Claims**



1. In a bimetal overload relay having an electrical switch which is enclosed in a case and which is operable between an untripped and a tripped position, a reset mechanism for manually resetting the electrical switch to its untripped position the combination comprising:

a plunger slidably mounted to said case for manual operation along an actuation axis between unactuated and over-actuated positions;

a reset arm rotatably attached to the plunger for rotation about a pivot axis which is substantially perpendicular to the actuation axis;

a first pivot point formed in said case and positioned to engage an operating portion of said reset arm at a point which is disposed to one side of said pivot axis;

a second pivot point formed in said case and positioned to engage said reset arm at a point which is disposed to the other side of said pivot axis; and

a bias spring disposed between said case and the operating end of said reset arm to urge said reset arm into engagement with said first pivot point and to urge said plunger into its unactuated position,

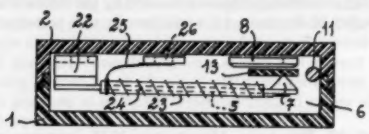
wherein said reset arm pivots about said first pivot point and rotates in one direction about said pivot axis when said plunger is manually depressed from its unactuated position to an actuated position in which the operating portion of said reset arm engages said electrical switch to reset it, and said reset arm pivots about said second pivot point and rotates in the opposite direction about said pivot axis when said plunger is depressed further from the actuated position to its over-actuated position.

4,157,524

MINIATURE CIRCUIT BREAKER

André G. Lamarche, Macon, France, assignor to Stopcircuit Société Anonyme, Macon, France

Filed Sep. 1, 1977, Ser. No. 829,935
Claims priority, application France, Mar. 25, 1977, 77 10149
Int. Cl.[2] H01H 71/16
U.S. Cl. 337—68 **14 Claims**



1. A miniature circuit breaker comprising:

a housing;

a fixed contact disposed in said housing;

a bimetallic element disposed in said housing and formed with a movable contact juxtaposed with said fixed contact;

a movable member in said housing displaceable between two positions corresponding respectively to closure of a circuit between said contacts and opening of said circuit;

a spring operatively connected to said member for shifting same between the first-mentioned and the second-mentioned positions;

a conductive element connected to said member and positioned to engage said contacts in said first position of said member;

and a blade-shaped insulating element on said member spaced from said element disposed so as to be positioned between said contacts in said second position of said member, said element engaging said movable contact so as to retain said member against displacement by said spring from said first position to said second position in the absence of deflection of said bimetallic element and to permit such displacement upon deflection of said bimetallic element in response to an excess current flow.

4,157,525

THERMOSTATIC ELECTRICAL SWITCH AND METHOD OF SWITCH ASSEMBLY

Jack W. Grable, Dayton, Ohio, assignor to Emerson Electric Co., Dayton, Ohio

Filed Mar. 2, 1978, Ser. No. 882,877
Int. Cl.[2] H01H 37/74
U.S. Cl. 337—343 **14 Claims**

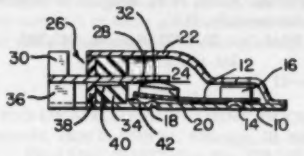
1. A thermostatic electrical switch for providing an electrically conductive path when the temperature of the switch is below a threshold temperature and for opening said path when the temperature of the switch is above said threshold temperature, comprising:

a conductive base plate,

a bimetal thermostatic snap element which is generally concave upwardly when its temperature is less than said threshold temperature and which snaps to a straightened position when its temperature is above said threshold temperature, said snap element attached at a first end thereof to the top of said base plate and making electrical contact with said base plate,

an electrical snap contact mounted on the upper surface of said snap element adjacent a second end of said snap element, opposite said first end, and electrically connected to said snap element,

a conductive cap covering said snap element and welded to said base plate around a portion of the periphery of said cap, thereby forming a casing with said base plate, said



casing defining a casing cavity in which is positioned said snap element and further defining an opening communicating with said cavity,

an electrically conductive terminal having a connector at a first end and a terminal contact at a second end thereof, and

mounting means in said opening for mounting said terminal such that said terminal extends through said opening with said terminal contact in contact with said snap contact when the temperature of said snap element is less than said threshold temperature,

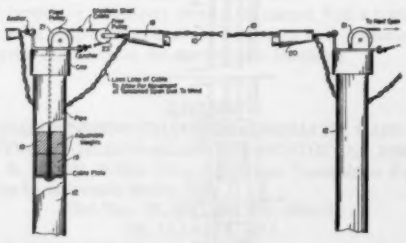
whereby an electrical path is provided from said casing to said conductive terminal via said snap element and said snap contact until the temperature of said switch exceeds said threshold temperature, at which time said snap element snaps to a straightened position, breaking the conductive path between said terminal contact and said snap contact.

4,157,526

MULTI-STAGE HEAT SENSING CABLE AND EMERGENCY COMMUNICATION SYSTEM

John S. Davies, 1010 Norumbega Dr., Monrovia, Calif. 91016

Filed Feb. 22, 1977, Ser. No. 770,673
Int. Cl.[2] H01H 37/76
U.S. Cl. 337—415 **4 Claims**



1. A heat-sensing cable to be supported in tension as at least one span between a plurality of anchoring means, said cable including a plurality of separate insulated electrical conductors, each of said electrical conductors including stranded electrical wires insulated by a sheath of thermal-responsive

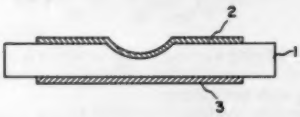
plastic material selected to soften when a particular temperature threshold is reached, said separate electrical conductors being twisted together so that when the heat sensing cable is mounted under tension and when the particular temperature threshold is reached the electrical wires of the individual conductors will rupture the sheath and twist together in positive electric contact, and in which said heat-sensing cable includes at least three separate insulated electrical conductors, and in which two of said insulated electrical conductors have sheaths of thermal-responsive plastic material selected to soften at the same temperature threshold, and in which one of said separate insulated electrical conductors has a sheath of thermal-responsive plastic material selected to soften at a temperature threshold higher than the temperature threshold of the other two conductors.

4,157,527

POLYCRYSTALLINE VARISTORS WITH REDUCED OVERSHOOT

Herbert R. Philipp, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 20, 1977, Ser. No. 843,793
Int. Cl.[2] H01C 7/10
U.S. Cl. 338—21 **10 Claims**



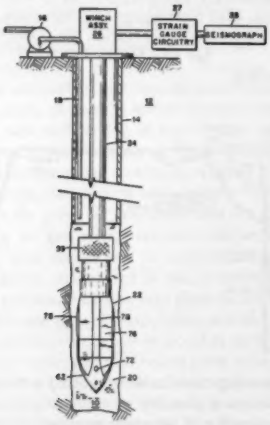
1. A polycrystalline metal oxide varistor body characterized by a breakdown voltage generally dependent on the thickness of said body, a portion of said body having a reduced thickness so as electrodes applied to said body are spaced apart nonuniformly, said thickness being effective to reduce voltage overshoot to a value less than the breakdown voltage of said thicker portion.

4,157,528

WELLBORE PRESSURE TRANSDUCER

Lowell Z. Shuck, Morgantown, W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 8, 1977, Ser. No. 849,570
Int. Cl.[2] H01L 10/10
U.S. Cl. 338—42 **2 Claims**



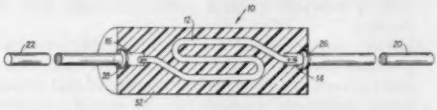
1. A liquid pressure-sensing transducer for use in a hydraulic fracturing operation wherein liquid is pumped into a wellbore penetrating a subterranean earth formation and pressurized to induce a fracture in the earth formation surrounding the wellbore, said transducer comprising in combination an elongated housing insertable into the wellbore penetrating the earth formation and having a cone-shaped end portion, a chamber within said housing, a diaphragm disposed in and dividing said chamber into first and second compartments, a hollow boss projecting from said end portion into said first compartment to a location adjacent said diaphragm, passageway means penetrating said housing for placing said first compartment and one surface of said diaphragm in registry with liquid in said wellbore outside of said housing, a portion of said passageway means being provided by a passageway in said hollow boss longitudinally extending from the end of said boss disposed adjacent to said diaphragm to a location in said cone-shaped end portion adjacent the apex of the cone, another portion of said passageway means being provided by a plurality of radially extending and circumferentially spaced apart bores penetrating the surface of the cone-shaped end portion and communicating with the longitudinally extending passageway in the cone-shaped end portion, said end of the longitudinally extending passageway in registry with the end of the boss and disposed adjacent to the diaphragm being outwardly flared for providing said end of the passageway with a diverging cross-section, strain gauge means affixed to said diaphragm on a surface thereof opposite said one surface and in said second compartment, and conducting means connected to said strain gauge for conveying a signal provided by the deflection of said diaphragm in response to variations in the pressure of said liquid in said first compartment.

4,157,529

LEAD FOR RESISTOR ELEMENT

Kenneth M. Prieskorn, Manchester, N.H., assignor to AMF Incorporated, White Plains, N.Y.

Filed Sep. 15, 1977, Ser. No. 833,674
Int. Cl.[2] H01C 1/034
U.S. Cl. 338—275 **1 Claim**



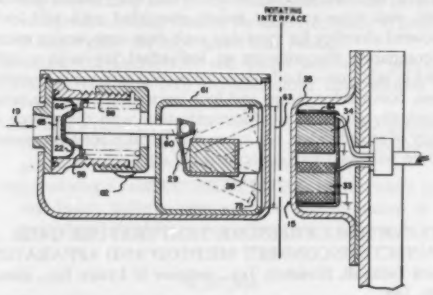
1. A molded electrical resistor comprising first and second axially aligned and spaced apart electrical leads,
each lead being circular in cross section throughout most of its length but having an integral substantially flat portion at one end and an integral radially extending disc shaped portion located inwardly from and adjacent the flat portion,
a resistance wire having first and second ends,
each end of the resistance wire being welded to a flat portion on a respective one of the leads,
said resistance wire being self supporting when welded to the leads,
each of said flat portions on the end of a lead having a continuous surface that is wider than the diameter of its respective lead that has a circular cross section, thereby to provide a flat surface to facilitate welding the resistance wire thereto,
a plastic housing molded about and engaging the self supporting resistance wire and the ends of the leads that include the flat and radially extending portions,
whereby the leads are bound in the molded housing by the flat and radial portions thereby to minimize twisting and axial forces on the welds that secure the resistance wire to said leads.

4,157,530

AUTOMATIC TIRE PRESSURE MONITORING SYSTEM

Ernest J. Merz, 745 Old State Rd., Berwyn, Pa. 19312

Filed Dec. 18, 1975, Ser. No. 641,817
Int. Cl.[2] B60C 23/04
U.S. Cl. 340—58 29 Claims



1. A system for monitoring a source of tire pressure on a vehicle to provide substantially no signal change within a predetermined range of satisfactory tire operating pressure, a rapidly changing signal when tire pressure falls below said pressure range and a different rapidly changing signal when tire pressure exceeds said pressure range comprising:

a pressure responsive actuator having a movable member,

means for moving said member rapidly toward said source of said tire pressure when said pressure falls below said range and to move rapidly away from said source when said pressure exceeds said range, said last named means having a dead band of substantially no movement when said pressure is within said predetermined range of satisfactory tire operating pressure,

biasing means urging said member toward said source of said tire pressure,

sensing means for sensing the rapid movement of said member and the direction of said movement, said sensing means having an output, and

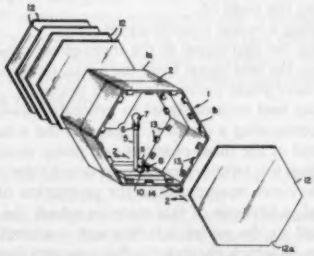
means for displaying the output of said sensing means to the operator of said vehicle.

4,157,531

AUTOMOBILE EMERGENCY SIGNAL

Howard I. Mont, 9 Overlook Dr., Port Washington, N.Y. 11050

Filed Oct. 7, 1976, Ser. No. 730,545
Int. Cl.[2] B60Q 7/02
U.S. Cl. 340—107 4 Claims



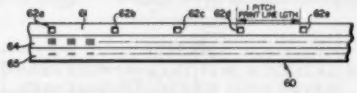
1. In a signal lamp having a housing which has an interior and wall portions defining a first opening providing access to the interior of the housing, an electrical light source mounted in the interior of the housing to provide in operation a light beam which leaves the housing by way of said opening, a translucent member fitted in said opening which member corresponds in overall size and shape to the overall size and shape of said opening so that said light beam passes through the translucent member fitted in the opening when leaving the housing wherein the improvement comprises the provision of a second opening in said housing which is substantially the same shape and size as said first opening and which provides access to the interior of said housing, at least four additional translucent members in which each additional translucent member includes a color filter and indicia thereon so that when any one of said four translucent members are secured in said first opening, the color of the light beam is modulated by the color filter and the indicia are readily visible, means for removably securing any one of said members in said first opening located along the periphery of said first opening, means for removably securing one or more of said members in said second opening located along the periphery thereof, said means located along said second opening being capable of removably retaining one or more of said translucent members in coextensive engagement with one another in said second opening, and said housing being of substantially a hexagonal shape, whereby the means for securing which are located along said second opening may be utilized to store all of said four additional translucent members or some portion thereof as well as retain one of said translucent members in said opening during use.

4,157,532

METHOD OF MACHINE READING DOCUMENTS

Grete Grunwald, 1236 E. 85th St., Chicago, Ill. 60619

Filed Mar. 7, 1977, Ser. No. 775,243
Int. Cl.[2] G06K 9/08
U.S. Cl. 340—146.3 G 12 Claims



1. A method of machine reading of documents having thereon printed characters comprising the steps of:

(a) generating a plurality of templates corresponding to the respective ones of the print characters on a document which is to be subsequently machine read from that document, each of said templates being generated on an elongated strip and spaced apart thereon a distance substantially corresponding to the length of a line of that document;

(b) providing on said elongated strip in association with each of said templates a machine readable label indentifying each of said corresponding print characters;

(c) interrogating one line of the document at a time with the respective ones of said templates to identify matches between said templates and the print characters on the document, whereby one line is interrogated by only one template at a time for matches between that template and the print characters on the document; and

(d) recording whichever label is associated with a template on the strip each time a match between its template and a print character on the document is identified.

4,157,533

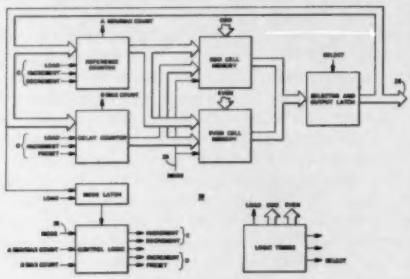
INDEPENDENT CHANNEL AUTOMATIC GAIN CONTROL FOR SELF-SCANNING PHOTOCELL ARRAY

Dale R. DuVall, Keller, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.

Filed Nov. 25, 1977, Ser. No. 854,955
Int. Cl.[2] G06K 9/12
U.S. Cl. 340—146.3 AG 9 Claims

1. A control circuit for automatically independently controlling the effective gain of each photocell in a scanned array of photocells comprising; means for storing a digital reference gain value for each photocell each time the photocell is

scanned, said value based upon the output of a photocell of a previous scan and means for independently varying the apparent gain of each photocell based upon the stored reference gain value.

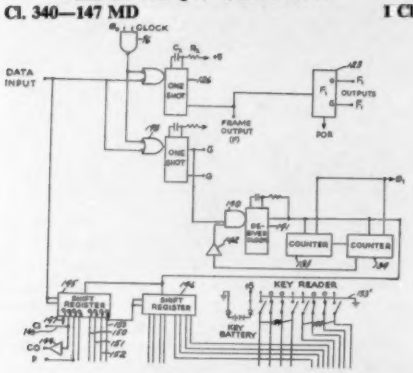


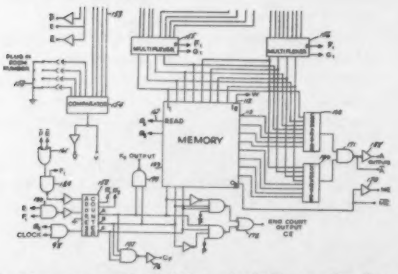
4,157,534

LOCKING SYSTEM FOR HOTELS

Jacob Schachter, 135 New York Ave., Huntington, N.Y. 11743

Filed Nov. 15, 1976, Ser. No. 741,894
Int. Cl.[2] H04Q *9/00*; E05B *49/00*
U.S. Cl. 340—147 MD **1 Claim**





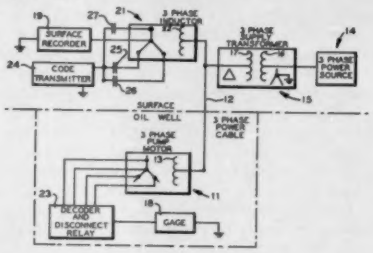
1. A locking system for buildings, including a plurality of individual rooms having entry doors thereto and a central location from which keys to said doors are issued, said system comprising: a plurality of individual key elements, each defining an individual printed circuit code and having a self-contained source of electrical energy communicating with said circuit; a key validator element located at said central location for assigning the codes of individual keys to specific rooms on a manually performed random basis; a plurality of first memory means, one at each room, communicating with said key validator element over existing telephone lines in said building for storing data relative to assignment of an individual key code, said memory means being located in spaced relation relative to the corresponding room door; said room doors having individual solenoid operated locks; a plurality of lock-associated circuits having non-volatile memory means, wave propagation means associated with said first memory means for transferring data from said first memory means to said non-volatile memory means, and wave receptor means associated with said lock-associated circuitry for receiving such data; comparator means for comparing the code on an individual key with a code stored in said non-volatile memory means; said wave receptor means, comparator means and lock-associated circuitry being periodically powered by communication with the source of energy of an individual key when said key is placed in communication with said lock-associated circuitry.

4,157,535

DOWN HOLE PRESSURE/TEMPERATURE GAGE CONNECT/DISCONNECT METHOD AND APPARATUS

Hayati Balkanli, Houston, Tex., assignor to Lynes, Inc., Houston, Tex.

Filed May 20, 1977, Ser. No. 799,014
Int. Cl.[2] G01V *1/40*; E21B *27/06*
U.S. Cl. 340—18 CM **1 Claim**



1. A method for selectively connecting a gage positioned in an oil well to the actual or virtual neutral of a three-phase pump motor wherein the pump motor is positioned in the oil well with a three-phase power cable connected between the three-phase motor windings and the three-phase power supply external to the oil well, a code transmitter being connected to the virtual neutral of said three-phase power supply, and a recorder external to the oil well being coupled to the three-phase power cable through a three-phase inductor for receiving pressure and temperature data generated by the gage, the switch means being connected between the gage and the actual or virtual neutral point of the three-phase motor, the method comprising the steps of:

generating a coded control signal;

coupling the said signal to the three-phase power cable;

coupling the said signal from the actual or virtual neutral of the three-phase pump motor to a decoder;

decoding said control signal to generate a switching signal for connecting a down hole gage to the actual or virtual neutral of the three-phase of said pump motor; and

switching the switch means from one to the other of two stable states in response to the generation of said switch signal, a first one of said states in which the gage is connected to the motor winding and a second one of said states in which the gage is disconnected from the motor winding,

said step of decoding the coded signal including the sub-steps of:

coupling any signal which is transmitted through the three-phase power line from the windings of the three-phase power motor to a virtual neutral point of the three-phase motor by a three-phase reactor;

counting the number of positive half cycles of said first

frequency alternating current wave form during a predetermined time period up to a predetermined number of half cycles to generate a reset pulse for the decoding circuitry;

counting the number of positive half cycles of said second and third frequency alternating current wave forms during sequentially alternating predetermined time period up to a predetermined number for each frequency to generate a single pulse for each given time period;

counting the numbers of said pulses which are generated during the sequential predetermined time periods and relate to second and third frequencies;

obtaining a pulse from a gate which combines the outputs of the two counters which count the number of sequentially generated predetermined time periods; and

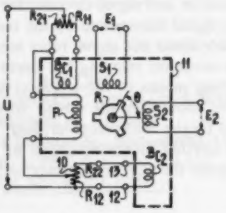
manipulating a switch to change the state of the switch when said inable pulse is obtained from the formation of the second and third frequency alternating currents.

4,157,536

SYNCHRONOUS TRANSMISSION DEVICE OF THE VERNIER RESOLVER TYPE INCORPORATING COMPENSATION OF PARASITIC COUPLING

Gerard Gauthier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 18, 1977, Ser. No. 779,082
Claims priority, application France, May 23, 1976, 76 08390
Int. Cl.[2] G08C *19/48*
U.S. Cl. 340—198 **8 Claims**



1. A synchronous transmission device of the vernier resolver kind incorporating compensation for parasitic couplings, which device comprises a stator made up of a magnetic circuit equipped with internally protruding elements, supporting two groups of windings, an input group and an output group, and comprises a rotor carrying externally protruding elements which in passing before the elements of the stator cause the reluctance of said circuit to vary, wherein are provided means for compensating for parasitic coupling between at least two certain windings of said groups which comprises firstly, means for picking off compensating voltages of one winding of one group, secondly, means for injecting directly said voltages into the other of the two certain windings experiencing the parasitic coupling, and thirdly, means for adjusting said compensating voltages in magnitude.

4,157,537

DISPLAY SYSTEM UTILIZING DIGITAL-ANALOG VECTOR GENERATION

Thomas B. Cheek; Douglas J. Doornink, both of Portland; Roger M. Handy, Hillsboro; David E. Heinen, Beaverton; Joseph H. Hubert, Wilsonville, and Ronald J. Wilson, Oregon City, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

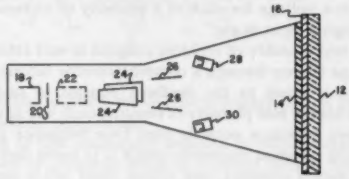
Filed Apr. 19, 1976, Ser. No. 677,947
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—706 **3 Claims**

1. A display system utilizing digital-analog vector generation to provide both refreshed and stored information simultaneously to a direct view storage tube, the system comprising:

a computer for supplying and controlling data to be displayed, said computer also being being conditioned to initiate system operation;

a memory coupled to receive and store said data, said memory including a display list containing vector position and status information and a program for controlling said position and status information;

a display controller operatively coupled to said memory and to said computer for receiving said position and said status information, said controller directing vector generation to jointly provide the refreshed and stored information in the form of electric signals, said controller including:



digital signal processor means for manipulating said data to provide a plurality of related signals for rate correcting a pair of vector generators, and a pair of analog vector generators responsive to said plurality of related signals for generating constant velocity vectors, said constant velocity vectors corresponding to said electric signals; and

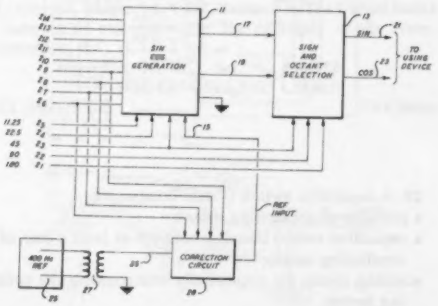
a direct view storage tube for receiving said electric signals and providing a display in accordance therewith, said display being refreshed and stored simultaneously.

4,157,538

CORRECTION CIRCUIT FOR A DIGITAL TO SYNCHRO/RESOLVER CONVERTER

David J. Simon, Saddle Brook, N.J., and Edward C. Costello, Scarsdale, N.Y., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 21, 1977, Ser. No. 853,341
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 SY **5 Claims**



1. Apparatus for correcting the transformation ratio variation versus input angle in a digital to synchro converter which has as inputs a digital angle and a reference voltage and which provides outputs corresponding to the sine and cosine of the input angle, said converter having an error which is of a cyclical and repetitive nature over a predetermined length of angular segment, said error also symmetrical about the midpoint thereof, comprising:

(a) a multiplexer having a plurality of signal inputs, a group of binary switching inputs and a single signal output, the multiplexer responsive to switch one of its signal inputs to

its signal output as determined by the bit pattern at its binary inputs;

(b) a plurality of resistors having one end coupled to the respective signal inputs of said multiplexer and their other end coupled to the source of reference voltage for the converter;

(c) an operational amplifier having its inverting input coupled to the signal output of said multiplexer, said amplifier having a resistor in its negative feed path, the output of said amplifier coupled as the reference input to said converter, the ratio between said input resistors and feedback resistor being such as to provide a correction to the reference voltage for each of a plurality of increments of the digital input angle;

(d) said plurality of resistors coupled to said reference voltage source through a common resistor having a nominal value equal to the feedback resistor of said amplifier whereby said plurality of resistors each will have an effective resistance equal to their own resistance plus that of said common resistance which is in series therewith; and

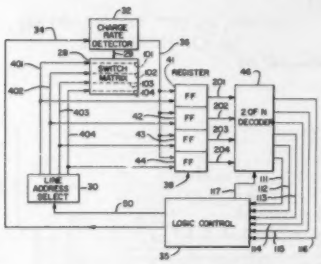
(e) means coupling said digital input angle signal to the binary inputs of said multiplexer adapted to couple to the binary inputs of said multiplexer the digital bit having a value corresponding to one half the angular segment plus a plurality of less significant bits thereafter in dependence on the angular segment with which each resistor is associated.

4,157,539

CHARGE RATE, CAPACITIVE SWITCH SYSTEM

Barney D. Hunts, Mountain Lakes, and Martin Brennan, Flanders, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,228
Int. Cl.[2] G06F *3/02*
U.S. Cl. 340—365 C **23 Claims**



10. A capacitive switch system comprising:

a plurality of conducting means;

a capacitive switch coupled between at least a pair of said conducting means;

scanning means for sequentially interrogating the conducting means;

a capacitance detector sequentially coupled to said conducting means in synchronism with said scanning means for detecting capacitance associated with each said conducting means and

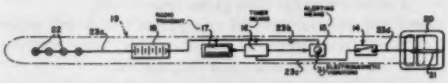
a reference capacitor coupled to said detector; and means coupled to said detector for simultaneously charging and discharging said reference capacitor and the capacitance associated with an interrogated conductor for enabling said detector means to simultaneously compare the charge rate of said reference capacitor with the charge rate of the capacitance associated with an interrogated conducting means.

4,157,540

WIRELESS ALARM SYSTEM

Stefan Oros, Cliffside Park, N.J., assignor to Anatronics Corporation, Fairfield, N.J.

Filed Jul. 13, 1976, Ser. No. 702,951
Int. Cl.[2] G08B *1/08*; H04Q *7/00*
U.S. Cl. 340—539 **7 Claims**



1. A wireless alarm system activated selectively by a person which comprises:

a portable wireless transmitter assembly adapted to be concealed on the person, said assembly comprising: a pressure actuated normally open contact switch adapted to be closed under pressure applied by the person, alerting means activated by the pressure actuated switch for alerting the person by a tactually perceivable signal when said switch is closed, timer means activated by the pressure actuated switch when said switch is closed, a radio transmitter activated by said timer means for transmitting a coded wireless alarm signal on at least one predetermined radio frequency, said timer means activating the radio transmitter a predetermined period of time after the pressure actuated switch is closed, and a battery power supply for the alerting means, timer means and radio transmitter;

a radio receiver and signal decoder for receiving the coded wireless signal transmitted by the radio transmitter;

an adjustable timer and signal relay means connected to the radio receiver for relaying the alarm signal on to personnel alerting means of the alarm system a predetermined period of time after the coded wireless alarm signal is received by the radio receiver; and

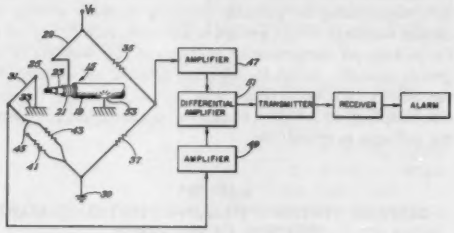
personnel alerting means activated by the alarm signal received from the adjustable timer and signal relay means.

4,157,541

DEVICE FOR DETECTING CABLE INSULATION FAULTS

Herman R. Harwell, Fort Worth, Tex., assignor to Malor Mfg. Inc., Fort Worth, Tex.

Filed Oct. 26, 1977, Ser. No. 845,477
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—540 **8 Claims**



1. An apparatus for use with machinery for laying insulating cable, for detecting if the cable insulation is damaged while the cable is being laid, comprising:

(a) a detection circuit mounted to the cable end, comprising:

a bridge circuit means connected between the cable and the reel for providing two outputs of different values should the resistance of the cable with respect to the reel drop below a selected minimum; and

differential amplifier means for receiving the outputs from the bridge circuit means and for providing an output if

the outputs differ in value by a selected minimum amount; and

(b) alarm means responsively sensitive to said detection circuit for providing an alarm signal if the output of the differential amplifier means reaches a selected minimum; the bridge circuit means comprising:

a first resistor connected to a constant value electrical potential source;

a first amplifier having an input connected to the first resistor on the side opposite the electrical potential source;

a second resistor connected between the input of the first amplifier and a circuit ground, thereby providing an electrical potential of constant value at the input of the first amplifier;

a third resistor connected between the circuit ground and grounded to the reel, which in turn is grounded to the earth;

a second amplifier having an input grounded to the reel;

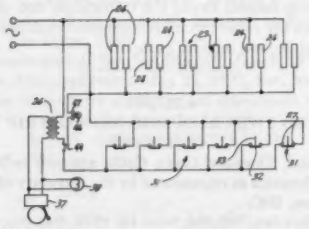
a lead extending from the electrical potential source to the cable, thereby providing an electrical potential at the input of the first amplifier if a finite resistance exists between the cable and the reel, the outputs of the first and second amplifier being connected to the differential amplifier means and being adjusted so as to be equal if the input at the second amplifier is substantially zero.

4,157,542

ELECTRICAL RECEPTACLE ASSEMBLY WITH PLUG REMOVAL ALARM

Patrick W. Smith, 124 Brennan St., Watsonville, Calif. 95067

Filed Jul. 1, 1977, Ser. No. 812,132
Int. Cl.[2] G08B *13/02*
U.S. Cl. 340—568 **4 Claims**



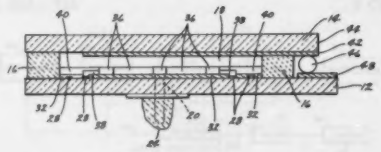
1. An alarm and outlet assembly for use in displaying small appliances and the like comprising a housing, means in the housing defining in an outer face of the housing a plurality of female electrical outlet receptacles each adapted to releasably receive a male electrical connector plug, a normally-closed switch associated with each receptacle and arranged to be operated into an open state upon engagement of a male electrical connector plug in the corresponding receptacle, the switches being comprised of a pair of spaced alarm contact conductors in the housing and, for each switch, a movable contact movable out of and into bridging engagement with the alarm contact conductors, and actuating means coupled to each movable contact responsive to engagement of a male connector plug in the associated receptacle for moving the movable contact out of bridging engagement with the alarm contact conductors, and biasing means biasing each movable contact into bridging engagement with the alarm contact conductors.

4,157,543

INDICIA DISPLAY DEVICE

Herman R. Person, Columbus, Nebr., assignor to Dale Electronics, Inc., Columbus, Nebr.

Filed Sep. 12, 1977, Ser. No. 832,398
Int. Cl.[2] H01J *17/48*
U.S. Cl. 340—758 **9 Claims**



1. A dielectric substrate for an indicia display device, having an upper surface, comprising,

a plurality of first conductors imposed on said substrate,

a first layer of dielectric material imposed on said conductors, said first layer having a plurality of apertures therethrough,

a plurality of indicia cathode segments superimposed on said first layer in a predetermined pattern, said cathode segments remotely positioned from said apertures,

a plurality of second conductors on said first layer electrically connecting said cathode segments to said first conductors, said second conductors passing through said apertures of said first layer of dielectric material and

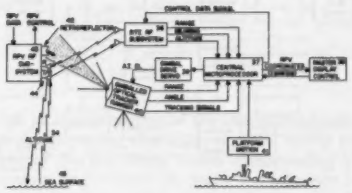
a second layer of dielectric material imposed on said first layer and said second conductors, the edges of said second layer abutting the edges of said cathode segments.

4,157,544

HYBRID TERMINAL ASSIST LANDING

Roy L. Nichols, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 21, 1977, Ser. No. 844,252
Int. Cl.[2] G01S *9/02*
U.S. Cl. 343—5 GC **13 Claims**



1. A hybrid terminal assist landing, HYTAL, system for fixed-wing and hovering aircraft from a base station comprising:

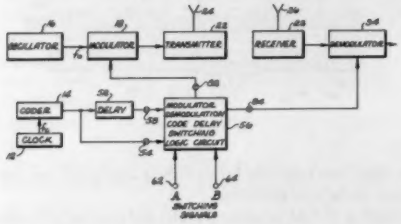
a radio frequency, RF, subsystem for command control of said aircraft from said base station; and

an optical control subsystem operationally slaved to said RF subsystem unless predetermined conditions occur upon which occurance said optical control subsystem takes over command control of said aircraft from said base station.

4,157,545
CORRELATION RADAR SYSTEM

Francis J. O'Farrell, Valencia, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Dec. 24, 1970, Ser. No. 101,361
Int. Cl.[2] G01S 9/06
U.S. Cl. 343—17.1 R 5 Claims



1. A correlation radar system having a transmitter circuit and a receiver circuit;

means for producing a code word of L bits in length at a predetermined frequency;

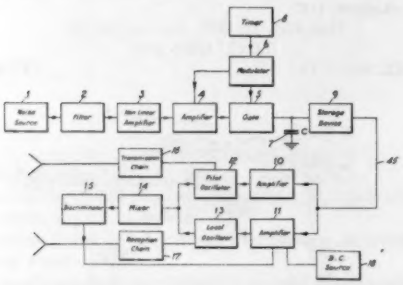
a delay network; and

switching means for coupling said code word directly to said transmitter circuit and through said delay network to said receiver circuit, and alternately coupling said code directly to said receiver circuit and through said delay network to said transmitter circuit.

4,157,546
VARIABLE FREQUENCY RADAR SYSTEMS

Yves Brault; Roland Carré, and Pierre Percy du Sert, all of Paris, France, assignors to Compagnie Generale de Telegraphie Sans Fil, France

Filed Jan. 7, 1959, Ser. No. 785,524
Claims priority, application France, Jan. 13, 1958, 58.755733
Int. Cl.[2] G01S 9/23
U.S. Cl. 343—17.2 R 17 Claims

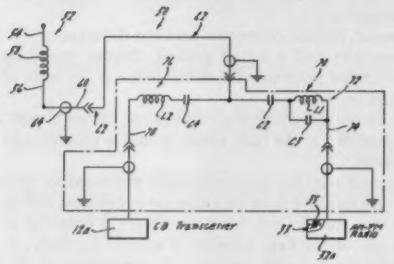


1. A system for radiating recurrent pulsed signals having a variable carrier frequency, said system comprising: a source of signals having a random voltage: a non-linear amplifier coupled to said source for amplifying said signals and providing amplified signals, said amplifier having a gain which decreases upon the amplitude of said signals exceeding a predetermined absolute value and having an output; means coupled to said output of said amplifier for storing an amplified signal for the duration of each recurrence period of said pulsed signals; and variable frequency, voltage controlled oscillator means coupled to said storing means.

4,157,547
SPLITTER FOR ANTENNA FOR AM-FM, CB AND METHOD OF CONVERSION

Ronald J. Freimark, Chagrin Falls, and Robert E. Isaacson, Streetsboro, both of Ohio, assignors to Tenna Corporation, Cleveland, Ohio

Filed Mar. 10, 1977, Ser. No. 776,244
Int. Cl.[2] H03H 7/10; H01Q 1/34
U.S. Cl. 343—180 13 Claims

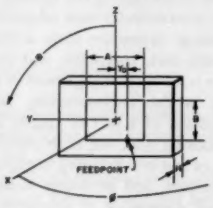


13. In an AM/FM receiver and CB transceiver combination: an antenna designed for CB transceiving having a loading coil; a first coaxial cable from the antenna, said first cable having an impedance designed for use with the AM/FM receiver; a parallel LC circuit connected between said first cable and an AM/FM receiver, resonant for CB frequency and thus of a high impedance to CB frequencies and of a low impedance for AM/FM frequencies; and a second coaxial cable connected to a CB transceiver and having an impedance designed for use with the CB transceiver; a series LC circuit connected between said first cable and said second cable, said series LC circuit being nonresonant for CB frequencies and thus of low impedance to CB frequency signals and having an inductance that provides a high impedance to FM frequency signals and having a capacitance that provides a high impedance to AM frequency signals; said series LC circuit having a net reactive component chosen to offset the impedance mismatch of the first cable with respect to the CB transceiver and of a magnitude that with the other circuit components matches the impedance of said second coaxial cable.

4,157,548
OFFSET FED TWIN ELECTRIC MICROSTRIP DIPOLE ANTENNAS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 740,690, Nov. 10, 1976, Pat. No. 4,072,951.
This application Oct. 31, 1977, Ser. No. 847,456
Int. Cl.[2] H01Q 1/38, 1/48
U.S. Cl. 343—700 MS 20 Claims



1. An offset fed twin electric microstrip antenna structure, comprising;

a. a dielectric substrate;

b. a twin pair of thin rectangular radiating elements disposed

one each on opposite sides of said dielectric substrate which electrically separates the twin radiating elements;

c. the radiating element on one side of said dielectric substrate being directly opposite to and the mirror image of the radiating element on the other side of said dielectric substrate;

d. each of said twin radiating elements being operable to be excited to radiate, and each of said twin radiating elements acting as a ground plane for the other;

e. the broadside fields of each of the antenna twin radiating elements being excited in identical modes of oscillation, radiating independently of each other with respective fields on opposite sides of the dielectric substrate being 180 degrees out of phase with one another;

f. said radiating elements each having a feed point located along an edge of the length thereof; said feed points being directly opposite to each other;

g. the length of the radiating elements determining the resonant frequency of said antenna;

h. the antenna input impedance being variable to match most practical impedances as said feed points are moved along the edge of the length of said radiating elements without affecting the antenna radiation patterns;

i. the antenna bandwidth being variable with the width of the radiating elements and the spacing between said twin radiating elements, the spacing between the twin radiating elements having somewhat greater effect on the bandwidth than the radiating element width;

j. said radiating elements oscillating in a resonant mode along their length and a non-resonant mode along their width when the radiating elements widths are greater than one half the radiating elements length.

4,157,549

DOPPLER RADAR MODULE

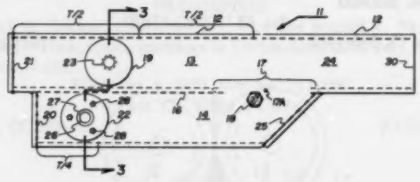
John W. Davis, San Diego, Calif., assignor to Radar Control Systems, San Diego, Calif.

Continuation-in-part of Ser. No. 584,109, Jun. 5, 1975, Pat. No. 4,042,934. This application May 31, 1977, Ser. No. 801,639

The portion of the term of this patent subsequent to Aug. 16, 1994, has been disclaimed.

Int. Cl.[2] G01S *9/42*; H01Q *13/06*

U.S. Cl. 343—786 **10 Claims**



1. A doppler radar module comprising:

a transmitting waveguide and a receiving waveguide in side by side relationship with a common wall therebetween, said transmitting waveguide having a shorted end, transmitter means based from said shorted end and an open end coupled to free space, said receiving waveguide having a shorted end and a receiver means spaced therefrom; and

an aperture disposed in said common wall, said aperture operable for coupling a portion of any transmitted energy into said receiving waveguide.

4,157,550

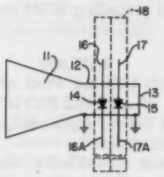
MICROWAVE DETECTING DEVICE WITH MICROSTRIP FEED LINE

Martin J. Reid, Chelmsford, Mass., and Robert W. Terry, Moultonboro, N.H., assignors to Alpha Industries, Inc., Woburn, Mass.

Filed Mar. 13, 1978, Ser. No. 886,037

Int. Cl.[2] H01Q *13/00*

U.S. Cl. 343—786 **9 Claims**



1. In a microwave detector apparatus comprising,

a ridged waveguide formed with a first longitudinal slot in a first walled structure, said first longitudinal slot facing a second longitudinal slot in the waveguide ridge for accommodating a stripline passing through the slots and diode means mounted on said stripline and located within the ridge gap between said first and second slots means including a second walled structure for covering said slots along their length and antenna means connected to the input of said ridged waveguide.

4,157,551

DISTORTION REDUCTION IN INK JET SYSTEM PRINTER

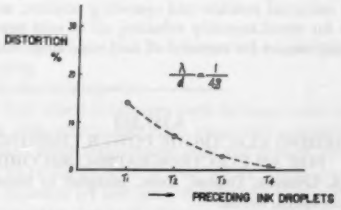
Rikuo Takano, Musashino; Yutaka Ohota, Matsuyama; Yoichi Yamamoto; Yuji Sumitomo, both of Nara; Toshio Kobayashi, Osaka, and Masahiko Aiba, Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Continuation-in-part of Ser. No. 627,377, Oct. 30, 1975, Pat. No. 4,032,924. This application May 10, 1977, Ser. No. 795,619

Claims priority, application Japan, Oct. 31, 1974, 49/126144

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—75 **3 Claims**



1. In an ink jet system printer of the charge amplitude controlling type for recording characters in a dot matrix pattern by a sequence of charged drops, means compensating for the effects of charges on previous ink drops in a sequence on the current charged drops, comprising:

a read only memory (ROM) storing digital character generation output formats;

means controlling said ROM to output a selected character format;

a character generator responsive to said digital character format output from said ROM to produce a step waveform character signal;

dot matrix determining means controlling said character generator to correlate said step waveform character signal to said dot matrix pattern;

storage means receiving said digital character format output from said ROM and retaining a predetermined significant number of preceding outputs from said ROM output for each given current output from said ROM therein; and

digital type proportioning means synchronously compensating said waveform for a current step therein as a function of said significant number of preceding ROM outputs by applying to said waveform respectively set compensation values for those charged drops included within said significant number of preceding ROM outputs.

4,157,552

PEN HOLDING DEVICE FOR AN AUTOMATIC DRAFTING DEVICE

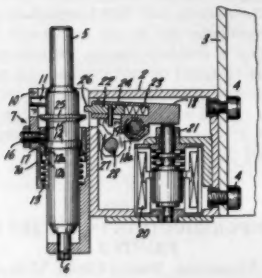
Hiroyuki Nakajima, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed May 27, 1977, Ser. No. 801,416

Claims priority, application Japan, May 27, 1976, 51-68123[U]

Int. Cl.[2] G01D *15/16*

U.S. Cl. 346—141 **4 Claims**



1. A pen holding device for an automatic drafting device having a drafting head frame, said pen holding device comprising a plurality of pen holders arranged in a row and removably fixed to said frame, a plurality of pens slidably held in said pen holders respectively), said pens being slidable lengthwise between an operating position and a retracted position, spring means biasing said pens in one direction, actuating means for each of said pens respectively, each said actuating means being engageable with the respective pen for moving said pen between retracted position and operating position, and releasing means for simultaneously releasing all of said pens from said actuating means for removal of said pens from said pen holders.

4,157,553

RECORDING ELECTRODE POWER LIMITING CIRCUIT FOR AN ELECTROGRAPHIC RECORDER

Paul A. Diddens, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 10, 1977, Ser. No. 805,530

Int. Cl.[2] G03G *15/044*; G01D *15/06*

U.S. Cl. 346—154 **12 Claims**

1. In an electrographic recorder having a plurality of recording electrodes which are individually selected and energized to record on a recording medium, the improvement comprising

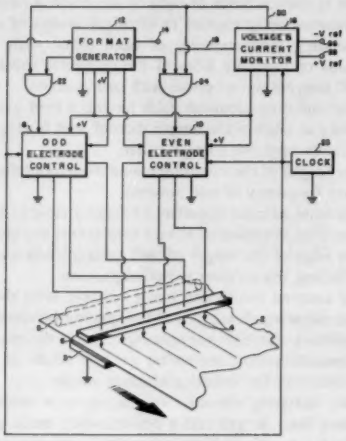
recording electrode energizing current and voltage supply means,

current and voltage monitor means connected to said supply means and responsive to the recording electrode energizing current and voltage supplied to operate the recording electrodes, said monitor means being arranged to produce an inhibit control signal representative of an excessive variation in the monitored energizing current and voltage,

signal gate means,

format generator means for selecting ones of said recording electrodes according to a recording format representative of an input signal to be recorded, said format generator means producing an electrode selection signal and an electrode firing control signal,

electrode control means responsive to said electrode selection signal and said electrode firing control signal for operating said recording electrodes by applying said energizing current and voltage from said supply means to selected ones of said recording electrodes,



first circuit means for applying said electrode selection signal to said electrode control means,

second circuit means for applying said electrode firing signal as an input signal to be gated to said gate means,

third circuit means for applying said inhibit control signal as a gate control signal to said gate means, and

fourth circuit means for applying an output signal from said gate means as an electrode firing signal to said electrode control means.

4,157,554

MULTIPLE-ELECTRODE PRINT HEAD FOR METAL PAPER PRINTERS

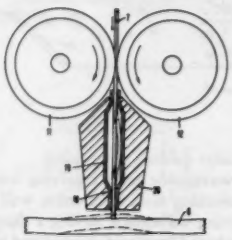
Dietrich J. Bahr, and Karl H. Burckardt, both of Herrenberg, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,122

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1976, 2652033

Int. Cl.[2] G03G *17/00*

U.S. Cl. 346—163 **10 Claims**



1. In a high resolution electroerosion printer,

the combination comprising a print head having a set of flexible electrode wires for recording by burning a pattern representing data symbols in a metal layer of a metal paper medium, and

support means for flexibly maintaining the ends of said set of wires in uninterrupted contact with said metal layer during recording including

individual glass guide tubes for each of said wires,

said wires being movable through said guide tubes so as to have an end protruding beyond the end of said guide tubes to flexibly contact said metal layer,

said guide tubes providing lateral support to limit bending of said wire in the vicinity of said protruding ends thereof, and

a print head body for fixedly holding the relative spacing of said guide tubes in a fixed array for recording said pattern, and

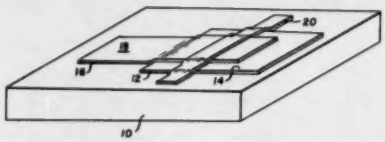
means for compensating for wear of said protruding ends of said wires comprising means operable for feeding said wires through said guide tubes for flexibly maintaining said protruding ends of said individual wires in uninterrupted contact with said metal layer.

4,157,555

SUPERCONDUCTING TRANSISTOR

Kenneth E. Gray, Naperville, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 7, 1977, Ser. No. 849,201
Int. Cl.[2] H01L *49/02*
U.S. Cl. 357—6 **10 Claims**



1. A superconducting transistor comprising:

a first tunneling junction having a predetermined resistance per unit area to form a collector junction;

a thin film of superconducting material disposed in contact with the first junction;

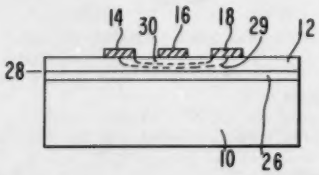
a second tunneling junction having a resistance per unit area that is high with respect to the resistance per unit area of the first tunneling junction to form an injector junction, the second tunneling junction disposed in contact with the thin film of superconducting material to form therewith a sandwich structure.

4,157,556

HETEROJUNCTION CONFINEMENT FIELD EFFECT TRANSISTOR

David R. Decker, Charlottesville, Va., and Ronald L. Moon, Menlo Park, Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Jan. 6, 1977, Ser. No. 757,258
Int. Cl.[2] H01L *29/80*
U.S. Cl. 357—22 **9 Claims**



1. A field-effect transistor comprising:

an active layer of semiconductive material, source, gate and drain electrodes on a first side of said active layer, and

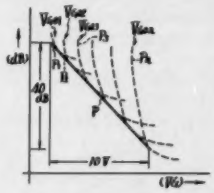
a semiconductor boundary layer adjoining the second side of said active layer, said boundary layer having a chemical composition different from said active layer and an electrical conductivity substantially lower than said active layer, said semiconductor layer and said active layer forming a heterojunction along said second side, whereby electrons are confined to flow only in said active layer by said heterojunction.

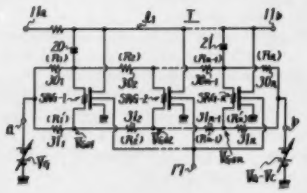
4,157,557

CONTROL CIRCUIT FOR SIGNAL TRANSMISSION

Shuichi Sato, Chofu; Makoto Hirabayashi, Kodaira; Yoshimi Hirata, and Takaaki Yamada, both of Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 667,110, Mar. 15, 1976, abandoned, which is a continuation of Ser. No. 491,041, Jul. 23, 1974, abandoned. This application Dec. 6, 1977, Ser. No. 858,014
Claims priority, application Japan, Jul. 23, 1973, 48-82822
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 **3 Claims**





1. A control circuit adapted for attenuating a signal transmission comprising:

a signal transmission path;

a pair of field effect transistors each having a main current portion with source and drain electrodes connected between said signal transmission path and ground, and each having an insulated resistive gate with a pair of gate electrodes mounted on said gate respectively over said main current portion for controlling a current therethrough, each of said field effect transistors having a different mutual conductance;

a pair of bias control means respectively connected to one of said pair of gate electrodes of each of said field effect transistors for applying a different bias control voltage to each of said pair of gate electrodes;

a first capacitor connected between said signal transmission path and the other one of said pair of gate electrodes of one of said pair of field effect transistors, and a second capacitor connected between said signal transmission path and the other one of said pair of gate electrodes of said second one of said pair of field effect transistors; whereby said differing bias control voltages and the differing mutual conductances permit the pair of field effect transistors to provide a combined linear attenuation characteristic.

4,157,558

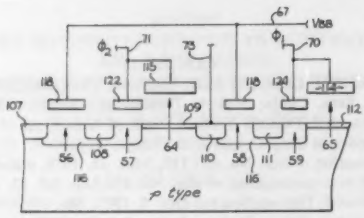
BUCKET-BRIGADE CHARGE TRANSFER MEANS FOR FILTERS AND OTHER APPLICATIONS

Gene P. Weckler, Campbell, Calif., assignor to Reticon Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 687,370, May 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 614,655, Sep. 18, 1975, abandoned. This application May 1, 1978, Ser. No. 901,566

Int. Cl.[2] H01L *29/78;* **G11C** *19/28;* **H01L** *29/04;* **H03H** *7/28*

U.S. Cl. 357—24 **5 Claims**



1. A bucket-brigade charge transfer means disposed on a silicon substrate of a first conductivity type, said transfer means including a plurality of stages each comprising:

a first and a second spaced apart region of a second conductivity type, each having a p-n junction and being disposed in said substrate;

a third region of said second conductivity type disposed in said substrate spaced apart from said first and second regions, said third region being more lightly doped than said first and second regions;

a first gate disposed above and generally between said first and second regions;

a second gate disposed above and generally between said second and third regions;

a member disposed generally above said third region, said member coupled to said second gate, said member and third region forming a capacitance means;

a fourth region, disposed in said substrate below said first and second gates, which fourth region completely surrounds the p-n junction of said second region, said fourth region being more heavily doped with a first conductivity type dopant than said substrate;

contact means for contacting a region in said substrate, said contact means contacting said first to permit sensing of charge in said regions;

whereby, by the application of potentials to said first and second gates, charge may be transferred in said bucket-brigade charge transfer means.

4,157,559

COAXIAL NUCLEAR RADIATION DETECTOR WITH DEEP JUNCTION AND RADIAL FIELD GRADIENT

Robert N. Hall, Schenectady, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 623,974, Oct. 20, 1974, Pat. No. 4,060,432. This application Jan. 31, 1977, Ser. No. 763,836

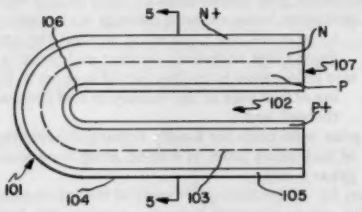
Int. Cl.[2] H01L *27/14*

U.S. Cl. 357—30 **18 Claims**

1. A germanium radiation detector comprising:

a hollow cylindrical germanium body having an inner region of one type conductivity, an outer region of opposite type conductivity and a p-n junction formed coaxially between said inner and said outer regions, said junction positioned so that the net excess of impurity atoms in said inner region is equal to the net excess of impurity atoms in said outer region;

a more heavily doped region of one type conductivity extending over the inner surface of said body for providing electrical contact to said inner region; and



a more heavily doped region of opposite type conductivity extending over the outer surface of said body for providing electrical contact to said outer region.

4,157,560

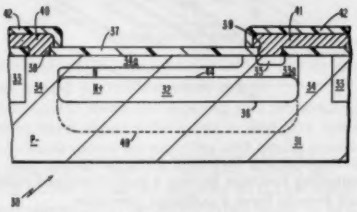
PHOTO DETECTOR CELL

Paul E. Cade, Colchester, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,128

Int. Cl.[2] H01L *27/14*

U.S. Cl. 357—30 **5 Claims**



1. A photo detector cell comprising

a body of semiconductor material of a first conductivity type having a surface,

a buried layer of semiconductor material of a second conductivity type disposed within said body beneath said surface wherein said buried layer has an upper region of a specified resistivity and a lower region having a resistivity different from that of said upper region

a single, continuous rectifying junction, formed between said layer and said body, disposed around all sides of and enclosing said layer of second conductivity type;

said junction being less than 10 microns from said surface, and

means for biasing said body and said layer of second conductivity type to form a depletion region around said junction that extends across the entire thickness of said layer of said upper region.

4,157,561

HIGH POWER TRANSISTOR

Yoshiaki Nawata, Yokohama; Masaaki Kobayashi; Kazuo Yajima, both of Kawasaki; Shigeo Iwasawa, Hayama, and Koji Takahashi, Kamakura, all of Japan, assignors to Fujitsu Limited, Japan

Filed Sep. 27, 1977, Ser. No. 837,303

Claims priority, application Japan, Oct. 27, 1976, 51-128927

Int. Cl.[2] H01L *29/72*

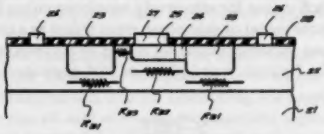
U.S. Cl. 357—36 **6 Claims**

1. A transistor comprising:

a collector region and an emitter region both having a first conductivity, and a base region having a second conductivity opposite to said first conductivity, said emitter region arranged in the base region,

said emitter region shaped as a closed loop so as to provide therein a central region having the same conductivity as said base region,

an emitter electrode contact portion provided at the approximate center of said central region of said emitter region, and



at least one narrow conductive area provided within said central region of said emitter region for electrically connecting said emitter region to said emitter electrode contact portion, said at least one narrow conductive area having the same conductivity as said emitter region and a higher resistivity than said emitter region whereby said at least one narrow conductive area operates as a stabilizing resistor for said emitter region.

4,157,562

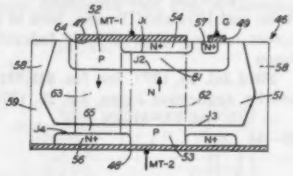
GATE CONTROLLED BIDIRECTIONAL SEMICONDUCTOR SWITCHING DEVICE HAVING TWO BASE REGIONS EACH HAVING A DIFFERENT DEPTH FROM AN ADJACENT SURFACE

Frederick A. D'Altroy; Daniel J. Harrington, and Gerald W. Miller, all of Center Valley, Pa., assignors to Western Electric Company, Inc. and Bell Telephone Laboratories, Incorporated, both of New York, N.Y.

Division of Ser. No. 703,162, Jul. 7, 1976, Pat. No. 4,066,483. This application Oct. 13, 1977, Ser. No. 842,002

Int. Cl.[2] H01L *29/747*

U.S. Cl. 357—39 **5 Claims**



1. A bidirectional semiconductor switching device, which comprises:

first and second main terminals located in electrical contact with the semiconductor body and adapted to be connected to an electrical potential and to apply the electrical potential across the semiconductor body in either one of two possible directions;

a gate terminal located adjacent the first main terminal and in electrical contact with the semiconductor body, and adapted to be connected to a trigger potential; and

first and second current paths through the semiconductor body between the main terminals, each path including semiconductor regions of alternately opposite conductivity types forming at least one transistor structure in each path, including a p-type base region and an n-type emitter region in each path, the p-type base region in the first path being bounded toward an n-type center region of the semiconductor body by a first junction at a first distance from the first main terminal, and forming an ohmic connection between the first main terminal and the gate terminal, the p-type base region of the second path being bounded toward the n-type center region of the semiconductor body by a second junction at a second distance, less than the first distance, from the second terminal and in ohmic contact with the second main terminal and being separated from the gate terminal by at least one reverse biased rectifying junction upon the main terminals becoming connected to the electrical potential in the absence of the trigger potential, the n-type emitter region of the first path extending substantially parallel to and being partially interposed between the first main terminal and the p-type base region of the first path the n-type emitter region of the second path being partially interposed between the second main terminal and the p-type base region of the second path, the p-type base region of the first path having a lower resistance to a current flow parallel to the n-type emitter region in such first path than the resistance to a current flow in the p-type base region in the second path parallel to the emitter region in such second path upon a connection of the potential across the main terminals and upon the connection of the trigger potential to the gate terminal with respect to the first main terminal.

4,157,563

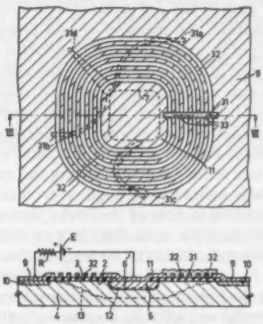
SEMICONDUCTOR DEVICE

Cornelis A. Bosselaar, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 425,505, Dec. 17, 1973, which is a continuation of Ser. No. 265,257, Jun. 22, 1972, abandoned. This application Mar. 6, 1975, Ser. No. 555,841

Int. Cl.[2] H01L *29/40, 27/02, 29/04*

U.S. Cl. 357—53 **8 Claims**



1. A semiconductor device comprising:

(a) a semiconductor body comprising a major surface, a first region of first conductivity type adjoining said surface, and a second region of second conductivty type adjoining said surface and having a greater doping level than said first region, said second region being substantially entirely surrounded within said semiconductor body by said first region and forming with said first region a p-n junction terminating at said surface;

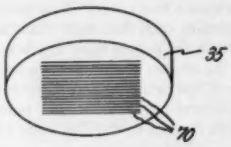
(b) an electrically insulating layer disposed at and at least partly covering said surface, said insulating layer extending across said p-n junction and comprising apertures located at said first and second regions; and

(c) a resistance layer having an elongated strip configuration that is substantially coil-shaped and comprises a plurality of turns, at least one of said turns completely surrounding said second region, said resistance layer being of high electric resistance material and being located on said insulating layer, said resistance layer being disposed over only said first region and laterally spaced from a point located above said p-n junction and electrically connected to said first and second regions via said apertures, said resistance layer covering at least a portion of said insulating layer located between said apertures and being electrically connected to at least a surface part of said insulating layer.

4,157,564
DEEP DIODE DEVICES

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 743,273, Nov. 19, 1976, Pat. No. 4,091,257.
This application Oct. 28, 1977, Ser. No. 846,576
Int. Cl.[2] H01L 29/04
U.S. Cl. 357—60 6 Claims



1. A semiconductor device comprising

a body of single crystal semiconductor material of thickness greater than 10 mils having first and second major opposed surfaces comprising respectively, the top and bottom surfaces thereof, and having a first type conductivity and a vertical axis perpendicular to the top and bottom surfaces;

a plurality of regions of second and opposite type conductivity, and opposed end surfaces, disposed in the body and extending between and terminating in the top and bottom surfaces, each of the end surfaces with a respective top or bottom surface, the material of said plurality of regions consisting of recrystallized semiconductor material of the body formed in situ in the body by the migration of a melt of metal-rich semiconductor material through the entire body from bottom to top by thermal gradient zone melting at a predetermined elevated temperature along a thermal gradient aligned substantially parallel with the said vertical axis of the body and having the metal distributed substantially uniformly throughout each entire region, the level of concentration of the metal therein being determined by the solid solubility limit of that metal in that semiconductor material of the body at that predetermined elevated temperature of migration, the metal comprising a sufficient quantity of at least one dopant impurity material to impart the second type conductivity thereto, the said regions being a low resistance path for conducting electrical currents between the major opposed surfaces of the body;

said regions of second type conductivity having vertical axes aligned substantially parallel with the vertical axis of the single crystal body and perpendicular to the body top and bottom surfaces; and,

a P-N junction formed by the contiguous surfaces of the materials of each said region and the body.

4,157,565
APPARATUS FOR ELIMINATING TIME BASE ERRORS FROM AN INFORMATION SIGNAL

Yasunobu Kuniyoshi, Tokyo; Takashi Okada, Yamato, and Takao Sumi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 19, 1977, Ser. No. 862,054
Claims priority, application Japan, Dec. 17, 1976, 51-152749
Int. Cl.[2] H04N 5/76
U.S. Cl. 358—8 28 Claims

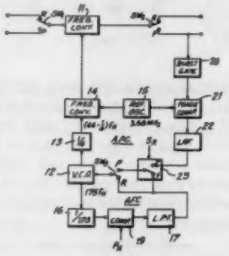
1. Apparatus for eliminating time base errors from a carrier-modulated information signal, comprising:

means including variable oscillating means for generating a carrier signal of controllable frequency and phase;

automatic frequency control means for detecting a time base frequency error in said carrier-modulated information signal and for producing a frequency error signal proportional to said detected frequency error;

automatic phase control means for detecting a time base phase error in said carrier-modulated information signal and for producing a phase error signal proportional to said detected phase error;

switch means for selectively supplying either said frequency error signal or said phase error signal as a control signal to said variable oscillating means to correspondingly control the frequency and phase of said generated carrier signal;



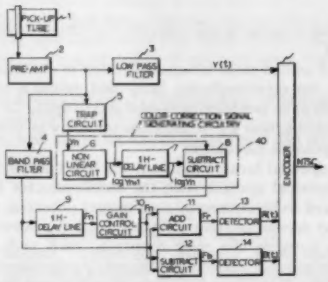
switch control means for controlling said switch means to supply said frequency and phase error signals to said variable oscillating means during selected, mutually exclusive intervals; and

converting means supplied with said information signal and said generated carrier signal to convert the carrier of said carrier-modulated information signal such that the converted carrier has substantially constant frequency and phase.

4,157,566
SINGLE TUBE COLOR TELEVISION CAMERA WITH COLOR CORRECTION

Ryuhei Nakabe, and Hiromichi Tanaka, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 25, 1977, Ser. No. 818,931
Claims priority, application Japan, Jul. 28, 1976, 51-90633
Int. Cl.[2] H04N 9/07
U.S. Cl. 358—44 13 Claims



1. A color television camera in which at least a first and a second color are spatially modulated in a pick-up tube by color filter means so that at least one of the modulated signals representing the first and second colors has a phase which is different from the phase of the same color in adjacent scan lines and color signals are produced utilizing the difference in phases in successive scan lines, said color television camera comprising:

a circuit means for receiving an output from the pick-up tube for deriving therefrom an unmodulated component signal;

a filter circuit means for receiving an output from the pick-

up tube for deriving therefrom a modulated component signal;

a color correction signal generating means coupled to said circuit means and receiving said unmodulated component signal for operating upon said unmodulated component signal to generate a color error correction signal;

a coupling means coupled to said filter circuit means and to said color correction signal generating means for developing a delayed modulated component signal which is delayed from said modulated component signal by one horizontal scanning period, and for controlling the amplitude of at least one of said modulated component signal and said delayed modulated component signal with said color error correction signal from said color correction signal generating means; and

a processing means coupled to said coupling means and receiving said modulated component signal and said delayed modulated component signal for production of color signals.

4,157,567

DROPOUT DETECTING CIRCUITRY FOR A FREQUENCY MODULATED CARRIER, PARTICULARLY FOR A VIDEO RECORDER

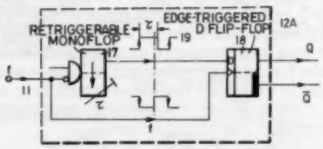
Werner Scholz, Gehrden, Fed. Rep. of Germany, assignor to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec, Switzerland

Filed Aug. 26, 1977, Ser. No. 828,089

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1976, 2641078

Int. Cl.[2] H04N 5/76

U.S. Cl. 358—127 **6 Claims**



1. In a dropout detecting circuit for a frequency modulated carrier, particularly for a video recorder, in which the carrier is modulated over a definite frequency deviation range and is demodulated in an FM detector whose output voltage is used in an evaluation circuit to produce a switching pulse representing the dropout, the improvement comprising, in combination, a demodulator constituting said FM detector and providing a digital output signal having a first value within such deviation range of the carrier and a second value outside such deviation range; and an evaluation circuit connected to said demodulator and producing said switching pulse responsive to only said second value of such digital output signal, said demodulator comprising a re-triggerable monoflop having a control input and an output; and an edge-triggered D flip-flop having first and second control inputs and having outputs; said FM carrier being applied to the control input of said retriggerable monoflop and to said first input of said edge-triggered D flip-flop; said output of said retriggerable monoflop being connected to said second control input of said D flip-flop; such switching pulse being derived at one of the outputs of said D flip-flop.

4,157,568

METHOD AND APPARATUS FOR OPTICALLY REPRODUCING A ROTATABLE RECORD WITH A SCANNING LIGHT BEAM OF CHANGING SIZE

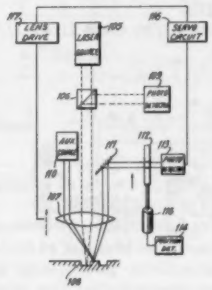
Hiroshi Ohki, Tokyo; Takashi Otobe, and Chiaki Kojima, both of Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 28, 1977, Ser. No. 855,303

Claims priority, application Japan, Nov. 30, 1976, 51-144563

Int. Cl.[2] G11B 7/18

U.S. Cl. 358—128 **18 Claims**



1. A method of reproducing information which is recorded in the form of spaced apart pits disposed in substantially concentric circular tracks of a rotatable record medium, said method comprising the steps of scanning said tracks with a light beam; detecting the radius of the respective track being scanned; and changing the size, at least in the direction along said tracks, of the scanning light beam as a function of said detected radius such that the size of the scanning beam is larger when the detected radius of the track being scanned is larger.

4,157,569

TELEVISION RECEIVER HAVING A SYNCHRONOUS DETECTION CIRCUIT AND A FREQUENCY DEVIATION-DETECTION CIRCUIT TO ACHIEVE A WIDE FREQUENCY RANGE CONTROL FUNCTION

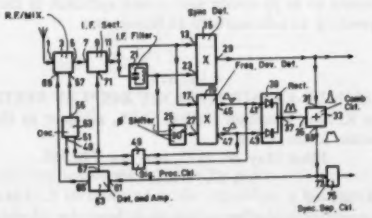
Hans J. Apeldoorn, and Peter J. H. Janssen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,575

Claims priority, application Netherlands, Sep. 17, 1976, 7610354

Int. Cl.[2] H04N 5/14, 5/44, 5/52

U.S. Cl. 358—160 **5 Claims**



1. A circuit for use in a television receiver having an intermediate frequency signal, said circuit comprising a filter tuned to said intermediate frequency, a synchronous detector having an input coupled to said filter and an output, a frequency deviation detector having an input coupled to receive said intermediate frequency signal and at least one output, a rectifier having an input coupled to said deviation detector output

and an output, and a combining circuit having a pair of inputs coupled to said rectifier and synchronous detector outputs respectively and an output means for supplying a function control signal to the receiver; whereby the control of said function is operative for a wide frequency range.

4,157,570

TV-CINE CONVERSION PROJECTOR

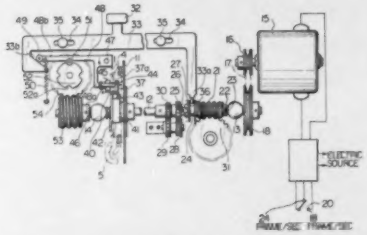
Kenichi Atsumi, Tokyo, Japan, assignor to Yamawa Denki K.K., Japan

Filed Mar. 2, 1978, Ser. No. 882,745

Claims priority, application Japan, Mar. 4, 1977, 52-22815; Jan. 17, 1978, 53-2736

Int. Cl.[2] H04N *3/36;* **G03B** *21/46, 21/48, 1/22*

U.S. Cl. 358—215 **9 Claims**



1. TV-cine conversion projector for converting projected images of a film fed at the feeding rate of 24 frames/sec. and 18 frames/sec. into TV pictures in cooperation with a TV camera tube while permitting the ordinary film projection at the feeding rate of the film of 24 frames/sec. and 18 frames/sec., wherein the improvement comprises a main shaft rotated at a predetermined constant rotational speed and driving a shutter so as to intermittently interrupting the projection light of the projector at a scanning rate of TV pictures in terms of fields/-sec. or the integer thereof, clutch means driven by said main shaft and capable of switching the rotational speed of a sound sprocket of the projector at a speed corresponding to either of substantially 24 frames/sec. and 18 frames/sec., intermittent film feeding means driven by said main shaft for intermittently feeding the film at substantially 24 frames/sec., intermittent film feeding preventing means selectively engageable with said intermittent film feeding means so as to render the latter to be inoperative once per four times of the actuation of said intermittent film feeding means, and switching lever means operably coupling said clutch means with said intermittent film feeding preventing means, said switching lever means being so constructed that said intermittent film feeding preventing means is engaged with said intermittent film feeding means only when said clutch means is switched by said switching lever means so as to rotate said sound sprocket at the speed corresponding to substantially 18 frames/sec.

4,157,571

FRAME-BY-FRAME MEMORY DISPLAY SYSTEM

Stephen K. Shu, Fountain Valley, Calif., assignor to Del Mar Avionics, Irvine, Calif.

Filed May 20, 1977, Ser. No. 798,765

Int. Cl.[2] G11B *5/00*

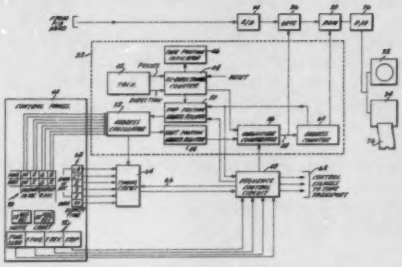
U.S. Cl. 360—8 **24 Claims**

1. Apparatus including a playback head for playing back signals recorded on a magnetic tape, comprising in combination:

tape transport means alternately moving the magnetic tape in opposite directions with respect to the playback head, said tape transport means moving the magnetic tape only once in each of said opposite directions to complete each tape movement cycle;

tachometer means operatively associated with said tape transport means for generating an enabling signal when a first predetermined point on the magnetic tape is located for sensing by the playback head;

gate means connected to the playback head and to said tachometer means and responsive to the enabling signal to selectively pass the signal sensed by the playback head; and,



storage means connected to said gate means for storing the signal selectively passed by said gate means as said tape transport means moves the tape in a first direction from said first predetermined point on the magnetic tape to a second point on the magnetic tape, said first predetermined point and said second point being determined by said tachometer means for each successive tape movement cycle.

4,157,572

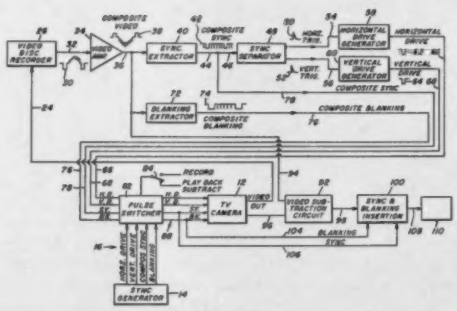
SUPERIMPOSITION OF TELEVISION IMAGES

William H. Kennedy, Monroeville, and Donald Sashin, Pittsburgh, both of Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Sep. 12, 1977, Ser. No. 832,020

Int. Cl.[2] G11B *5/78, 31/00;* **H04N** *7/18*

U.S. Cl. 360—33 **12 Claims**



1. Apparatus for the superimposition of television images comprising

recorder means for recording and playing back composite first video signals,

image generating means for providing second video signals,

drive means for driving said image generating means synchronously with respect to said recorder means responsive to receipt by said drive means of said first video signal,

said drive means including circuit means for separating from said composite first video signals, horizontal drive, vertical drive, sync and blanking signals and feeding said separated signals to said image generating means to thereby effect control of the operation of said image generating means by said recorder means, and

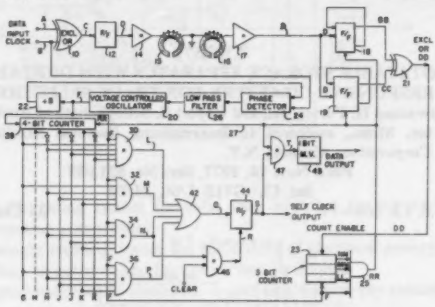
signal combining means for superimposing said first and second video signals.

4,157,573

DIGITAL DATA ENCODING AND RECONSTRUCTION CIRCUIT

Shirzad Aghazadeh, and Howard L. Stahle, both of Burbank, Calif., assignors to The Singer Company, New York, N.Y.

Filed Jul. 22, 1977, Ser. No. 818,265
Int. Cl.[2] G11B *5/02*
U.S. Cl. 360—51 **8 Claims**



1. Digital magnetic recording and reproducing apparatus that materially reduces data errors due to imperfections in the magnetic recording medium, excessive shoulders, electrical noise and the like comprising:

means for recording onto said magnetic medium a phase modulated data signal;

means for reading and shaping said magnetically recorded signal into a pulse waveform to reproduce said recorded data signal; and

means coupled to receive said reproduced data signal for producing a spike signal for each transition in said reproduced data waveform except for those pulses therein having less than a predetermined time duration;

said spike signal producing means including

a source of timing pulses,

a counter coupled to receive said timing pulses for determining said predetermined time duration, and

first gating means coupled between said counter and said reproduced data signal for enabling said gate to selectively enable said timing pulses to step said counter in response to at least some of said transitions in said reproduced data signal.

4,157,574

NOISE REDUCTION CIRCUIT FOR MULTIPLE GAP MAGNETIC HEAD FOR AUTOMATIC TYPEWRITER

Michael Stamer, Lincolnwood, Ill., assignor to A. B. Dick Company, Chicago, Ill.

Filed May 16, 1977, Ser. No. 797,014
Int. Cl.[2] G11B *5/47, 5/20*
U.S. Cl. 360—66 **3 Claims**

1. In an automatic typewriter system of the type that may employ a magnetic media on which information may be stored and erased, and which includes electric circuitry for operating a typewriter, the combination of:

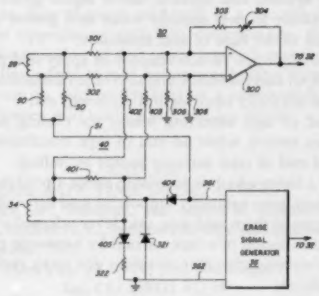
a read inductance associated with magnetic material defining a read gap adjacent to the operational position of the magnetic media;

an erase inductance associated with magnetic material defining an erase gap, which erase gap is positioned close to said read gap;

a read signal handling network channel coupled to said read inductance for transferring electrical signals developed in the read inductance to the electric circuitry;

means for selectively operationally energizing the erase signal and for insuring that the erase function and the read function are not performed simultaneously;

a signal shaping circuit coupled between the erase inductance and said read signal handling network channel for developing a noise reducing signal from signals picked up by said erase inductance when it is not operationally energized and coupling it to said channel so as to add it to the signal developed by said read inductance during the read function, said signal shaping circuit including a first impedance in parallel with said erase inductance for frequency response shaping the erase inductance circuit to match the frequency response of the read inductance circuit.

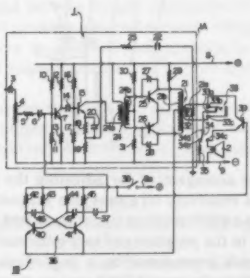


4,157,575

TAPE END WARNING APPARATUS

Ken Satoh, and Tuneo Yanagida, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1976, Ser. No. 713,344
Claims priority, application Japan, Aug. 19, 1975, 50-113951[U]; Aug. 22, 1975, 50-115878[U]; Aug. 22, 1975, 50-115879[U]; Oct. 3, 1975, 50-135385[U]; Oct. 3, 1975, 50-135386[U]; Dec. 12, 1975, 50-168208[U]; Dec. 17, 1975, 50-170896[U]; Dec. 23, 1975, 50-173290[U]; Dec. 23, 1975, 50-173291[U]; Dec. 23, 1975, 50-173289[U]; Dec. 27, 1975, 50-177357[U]; Dec. 27, 1975, 50-177358[U]
Int. Cl.[2] G11B *18/06, 23/30*
U.S. Cl. 360—74.1 **5 Claims**



1. A tape end warning apparatus for use in a tape recorder of the type which includes an audio amplifier, a loudspeaker, a first switch for connecting an output of said amplifier to said loudspeaker when said tape recorder is in a playback mode and for disconnecting said output of said amplifier to said loudspeaker when said tape recorder is in a record mode, a tape cassette receiving chamber, a drive shaft extending into said receiving chamber and adapted to engage a drive shaft recess in a tape cassette when a tape cassette is placed within said receiving chamber and drive means for driving said drive shaft, said tape end warning apparatus comprising:

a power supply;

an oscillator for generating an electrical alarm signal when said power supply is applied thereto, the output of said oscillator being coupled to an input of said amplifier;

a switching transistor connected to said output of said oscillator and to said speaker in such a manner that said transistor applied said electric alarm signal generated by said amplifier to said speaker when said power source is applied to the base of said transistor;

a normally open switch adapted to apply said power source to both said oscillator and said base of said transistor when said normally open switch is closed; and

an end of tape detecting means for closing said normally open switch when an end of tape condition is detected, said end of tape detector means including:

(1) a lever which is pivotable about a predetermined axis, said lever rotatably supporting said drive shaft at a point spaced from said axis, said lever adapted to pivot when the tension of a tape carried by a cassette placed in said receiving chamber increases due to an end of tape condition;

(2) said lever adapted to close said normally open switch when said lever is rotated due to said end of tape condition whereby said power source is applied to the base of said transistor and to said oscillator and an audible alarm signal is generated by said speaker.

4,157,576

TRACK-DEPENDENT TRANSDUCER POSITION CONTROL IN MAGNETO-DYNAMIC STORAGE DEVICES, AND A MAGNETIC RECORDING MEDIUM TO WHICH THIS METHOD IS APPLICABLE

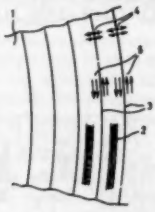
Joachim Hack, Ludwigshafen, and Karl Uhl, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 605,412, Aug. 18, 1975, abandoned. This application Aug. 2, 1977, Ser. No. 821,205

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1974, 2439546

Int. Cl.[2] G11B *21/10, 5/56*

U.S. Cl. 360—77 **21 Claims**



1. A servo arrangement for adjusting the position of transducer means relatively to a movable magnetic recording medium having an information signal track and also having, situated at least in the proximity of said information signal track, a reference track represented by a single-line-shaped transition between differently magnetized regions recorded on said medium;

said transducer means including a magnetic head system with at least one air gap which, in scanning said reference track, produces a voltage proportional to the variation of the magnetic flux in said head system; and

said servo arrangement comprising

means for imparting to said magnetic head system an alternating movement relatively to said reference track so as to generate a magnetic flux variation,

means for deriving from said produced voltage a correcting signal indicative of a misalignment of said transducing means relatively to said reference track, and

means effective in response to said correcting signal, for adjusting the position of said transducing means relatively to said reference track in a re-aligning sense.

4,157,577

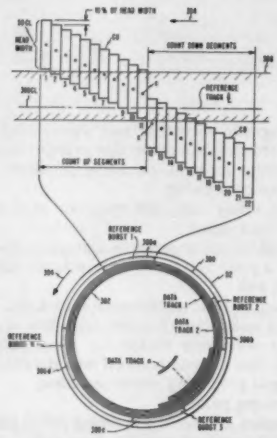
ROTATABLE STORAGE APPARATUS WITH DIGITALLY RESPONSIVE CIRCUITRY FOR TRACK SELECTION

Townsend H. Porter, Jr., and Robert E. Schopp, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,089

Int. Cl.[2] G11B *5/00, 21/08*

U.S. Cl. 360—77 **33 Claims**



1. Data storage apparatus comprising:

a moveable magnetic data storage medium having a magnetic track thereon,

digital characters of a certain bit composition magnetically encoded with their centers on one side of the center line of said track and with their centers at different distances from said center line,

digital characters of another certain bit composition magnetically encoded with their centers on the other side of the center line of said track and with their centers at different distances from the track center line,

a transducer located to detect said magnetically encoded characters on said storage medium as said storage medium moves,

a first circuit connected with said transducer and constructed to be responsive to only the bit composition of said digital characters having their centers on one side of the center line of said track,

a second circuit connected with said transducer and constructed to be responsive to only the bit composition of said digital characters on the other side of the center line of said track, and

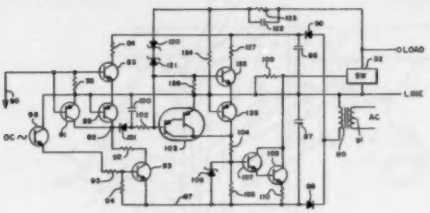
means for comparing the numbers of digital characters of said different bit compositions detected by said transducer and said first and second circuits whereby to determine the position of said transducer with respect to said track center line.

4,157,578

DV/DT PROTECTION FOR SOLID STATE SWITCHES

Zoltan L. Gyursanszky, Don Mills, Canada, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 20, 1977, Ser. No. 844,094
Claims priority, application Canada, Nov. 2, 1976, 264662
Int. Cl.[2] H02H *9/04*
U.S. Cl. 361—91 **17 Claims**



1. A gating system for solid state switches having dv/dt protection comprising:

supply terminal means for the supply of electrical energy;

load terminal means for connection to a load;

solid state switch means for connecting said supply terminal means to said load terminal means;

gating means connected to said solid state switch means for turning on said solid state switch means; and,

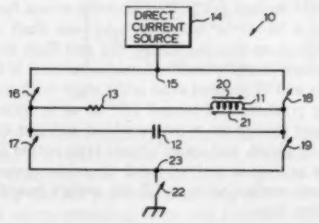
dv/dt sensing means connected to said supply terminal means and said gating means for turning on said solid state switch means when said solid state switch means experiences a damaging rate of rise of voltage thereacross.

4,157,579

PULSE GENERATION EMPLOYING PARALLEL RESONANT LC CIRCUIT FOR ENERGIZING A COIL WITH SQUARE WAVE

Michael W. Paul, Mississauga, Canada, assignor to Barringer Research Limited, Rexdale, Canada

Filed Dec. 23, 1977, Ser. No. 864,060
Claims priority, application Canada, Jan. 4, 1978, 269077
Int. Cl.[2] H01H *47/32*
U.S. Cl. 361—152 **4 Claims**



1. A pulse generator for energizing a coil with periodic bipolar current pulses of predetermined amplitude, period and repetition rate and of generally square wave form, comprising:

(a) a capacitor connected in parallel to the coil to form a closed oscillatory circuit of predetermined frequency,

(b) controllable circuit means for electrically connecting and disconnecting said oscillatory circuit and a source of direct current of predetermined voltage and current, said circuit means including first controllable switch means for alternately reversing the direction of flow of current from said direct current source through said coil during successive current pulses, and second switch means for opening and closing said circuit means at predetermined intervals to thereby disconnect said coil from said direct current source, and

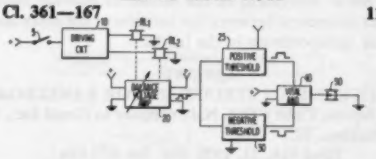
(c) means for periodically activating said first controllable switch means at predetermined times, whereby upon abruptly opening said second switch means current flows in said coil in a first direction and upon activating said first controllable switch means, current from said source is caused to flow through said coil in a second direction which is opposite to said first direction, so that upon successive opening of said second switch means, leading and trailing edges of said pulses are thereby formed, and the current in said coil is kept at a substantially steady level between said leading and trailing edges.

4,157,580

FAIL-SAFE TIME DELAY CIRCUIT

John H. Auer, Jr., Fairport, and David B. Rutherford, Jr., Rochester, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Jan. 31, 1978, Ser. No. 874,007
Int. Cl.[2] H01H *47/18*
U.S. Cl. 361—167 **11 Claims**



1. A vital time delay circuit providing a signal no less than a predetermined time after an input stimulus comprising:

a pair of relays;

a driving circuit for said relays producing, when stimulated, a pair of asymmetrical driving signals each of duty cycle greater than 50%, one for each relay to operate said relays between energized and de-energized conditions, said driving signals phased to maintain at least one of said relays energized;

a pair of voltage amplifiers each including contacts of both said relays to produce a bi-polar output waveform with positive and negative excursions increasing as a function of time;

first and second sensing means responsive to said output waveform to produce first and second voltage waveforms each changing in potential and opposite in phase when positive and negative excursions exceed a predetermined threshold;

a vital AND circuit responsive to said voltage waveforms to produce an output voltage if, and only if, said waveforms change repetitively in potential in phase opposition.

4,157,581

HAND-OPERATED BULK ERASER FOR MAGNETIC TAPE CASSETTES

Yoshizawa Keiichi, Tokyo, and Yamakawa Kokichi, Machida, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1977, Ser. No. 827,363
Claims priority, application Japan, Sep. 1, 1976, 51/116192[U]
Int. Cl.[2] H01F *13/00*
U.S. Cl. 361—267 **8 Claims**

1. A magnetic bulk eraser for magnetic tape, comprising:

axle means defining a rotational axis,

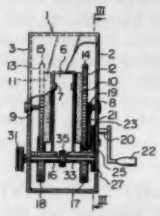
a pair of parallel circular disks coaxially and rotatably mounted on said axle means, each disk having a plurality of permanent magnetic poles on the periphery thereof, so aligned that the facing magentic poles are of like polarity,

an enclosure having a guide slot through which a magnetic

medium may be passed, said guide slot extending between said disks perpendicular to the rotational axis defined by said axle means,

a holder for a magnetic storage element,

a drive means with a manually operated handle and including a gear mechanism for rotating said circular disks at high speed, and



transmission means coupled between said drive means and said means for transporting the holder for changing the ratio of the angle through which the handle is rotated to the linear movement of the holder to provide synchronized movement between the rotation of the disks and the linear transportation of the holder.

4,157,582

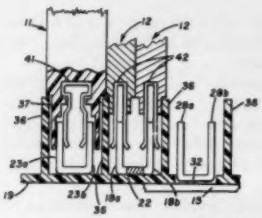
PLUG-IN CONTACT STRUCTURE FOR PANELBOARD

Felix E. Myers, Cherry Hill, N.J., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Feb. 21, 1978, Ser. No. 879,624

Int. Cl.[2] H02B *1/04*

U.S. Cl. 361—353 **7 Claims**



1. An assembly including main conductor means for a panelboard and first and second plug-in type circuit breaker modules connected to said assembly, said first module being of a first width and said second module being of a second width approximately two times the first width; said main conductor means including first and second bus bars; a plurality of first contact sections formed integrally with said first bus bar and a plurality of second contact sections formed integrally with said second bus bar; each of said first and second contact sections including first and second generally planar parallel contact blades spaced by approximately said first width; said blades of said plurality of said first and second contact sections being arranged in a row with the blades being in spaced parallel planes generally perpendicular to the length of said row; said first and second contact sections being interleaved; said first blade of each of said first contact sections being spaced from said second blade of a different one of said contact sections by approximately said first width; each of said blades being constructed to constitute a male plug-in contact to be engaged by a female plug-in contact of a circuit breaker module of said first width; each of said contact sections being constructed so that the first and second blades thereof cooperate to constitute a female contact to receive a male plug-in contact of a circuit breaker module of said second width; said first module including a female plug-in contact having jaws in direct engagement with opposite sides of a first of said blades; said second module including a male plug-in contact having first and second sides in direct engagement with the respective first and second blades of one of said contact sections.

4,157,583

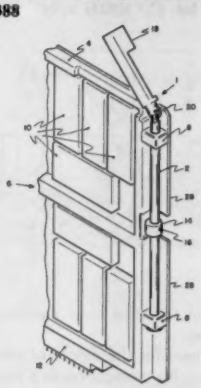
CIRCUIT BOARD CLAMPING ASSEMBLY

Fred J. Basmajian, and Ronald C. Kurtz, both of Binghamton, N.Y., assignors to General Electric Company, Utica, N.Y.

Filed Nov. 4, 1977, Ser. No. 848,631

Int. Cl.[2] H02B *1/04*; H05K *1/00*

U.S. Cl. 361—388 **8 Claims**



1. A circuit board assembly comprising:

a cam shaft secured alongside an edge of said circuit board by an attachment means by which the cam shaft is rotatably supported;

a first cam member mounted on said cam shaft for movement therewith;

a mounting frame to support said circuit board;

a first elongated guide attached to said mounting frame, one side of said first guide mounted adjacent to the front side of said circuit board;

a second elongated guide attached to said mounting box, one side of said second guide mounted adjacent to the back side of said circuit board;

a heat conductive strip located alongside said circuit board adjacent to said second guide; and

latching means secured to said cam shaft to rotate said cam shaft upon rotation of said latching means, whereby said first cam member pushes in a direction perpendicular to the axis of said cam shaft against said first guide thereby exerting an opposite lateral force at said attachment means to force said heat conductive strip into intimate contact with said second guide, said latching means further comprising a handle attached to said cam shaft at a pivot connection, so that the handle can rest flush to the top of said circuit board when the board is secured in the mounting box and be pivoted at an acute angle with respect to its resting position, and turned 180° so as to rotate the cam shaft and relieve the pressure which said cam exerts upon said first guide, and using a lever type action said handle can be pushed in a downward direction against an adjacent unit surface so as to lift the circuit board from said mounting box.

4,157,584

OVERHEAD LIGHTING FIXTURE

Yogendra C. Bhatt, Westerville, Ohio, assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Nov. 21, 1977, Ser. No. 853,195

Int. Cl.[2] B60Q *3/02*

U.S. Cl. 362—74 **11 Claims**

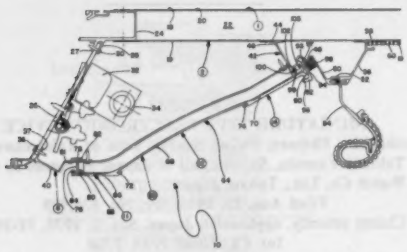
1. An overhead light fixture for a transit vehicle comprising:

a housing having an open top and bottom, the ceiling of said transit vehicle forming the closure for said open top,

means hinging a first side of said light transmitting panel to a first side of said housing adjacent the open bottom of said housing,

latch means for detachably securing a second side of said light transmitting panel to a second side of said housing adjacent its open bottom,

said second side of said housing comprising a panel member having a light housing web portion and a latch web portion, said latch web portion having a groove formed therein, said latch means also comprising a latch member



having a head, a body, and a foot, said groove in said latch web portion having a configuration to matingly receive the head of said latch and

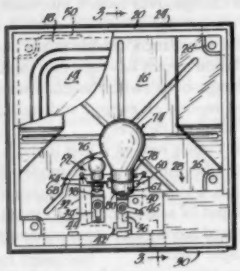
first and second biasing means for urging continuing engagement of said latch member with the edge of said light transmitting panel when said second side is secured by said latch member.

4,157,585

LIGHT FIXTURE

Jerry H. Freeman, 1100 W. Pendleton Pl., Mt. Prospect, Ill. 60056

Filed Apr. 14, 1977, Ser. No. 787,340
Int. Cl.[2] F21S *1/02*; B60Q *1/00*
U.S. Cl. 362—248 **6 Claims**



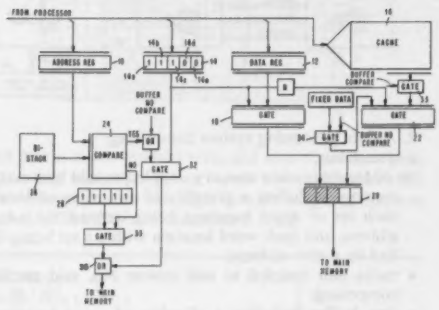
1. A light fixture comprising: a frame having first and second open sides, a terminal block associated with said frame, first and second side-by-side terminal clips mounted on said frame and having contact portions extending outwardly therefrom, electrical wires extending from said terminal block and connected to said terminal clips; a mounting plate secured to said first open side of said frame, said mounting plate having external dimensions similar to the external dimensions of said first open side so as to effectively close said first open side, a bracket formed from a portion of said mounting plate, unitary therewith and extending outwardly therefrom, first and second side-by-side openings in said bracket, the axes of said openings being parallel to one another and perpendicular to said bracket, each opening being disposed in alignment with one of said clip contact portions, means providing an arcuate flange extending at least partially around each of said openings and adapted to receive therewithin the cylindrical base of a light bulb, said bracket and said flanges being adapted to support said light bulbs with a contact point at the end thereof in electrically conductive engagement with the contact portion of one of said terminal clips; and a lens secured to the second open side of said frame and covering said mounting plate and light bulbs associated therewith.

4,157,586

TECHNIQUE FOR PERFORMING PARTIAL STORES IN STORE-THRU MEMORY CONFIGURATION

Patrick M. Gannon, Poughkeepsie; Julius D. Jones, Unionvale; Dale M. Junod, Highland; Richard L. Partridge, Wappingers Falls, and Thomas R. Wright, Shokan, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1977, Ser. No. 794,323
Int. Cl.[2] G06F *7/02*
U.S. Cl. 364—200 **4 Claims**



1. In a hierarchical memory system using a store-thru algorithm in which a full or partial word of data supplied by a processor is generally written in a full or partial store operation respectively, directly into the main memory for the memory system instead of being written through a buffer store which is interposed between the main memory and the processor so as to supply data from the processor to the main memory but which store-thru algorithm sometimes performs partial store operations as a full store operation by reading data bytes out of the buffer store and mixing them with data bytes supplied by the processor to form a new word of data on the basis of control bits supplied by said processor, the improvement in performing such partial store operation comprising:

storage means for storing main memory addresses of data words stored in said buffer store that have been changed in main memory by sources not associated with the buffer store;

comparison means for comparing an address in main memory where a partial store is to be performed with main memory addresses of words stored in said storage means and for generating a compare signal when said address in main memory is the same as an address changed by said sources and a no-compare signal when said address in main memory is not the same as any address changed by said sources;

means responsive to said comparison means for performing a partial store operation in main memory using a word made up of data supplied by the processor and data in main memory when a compare signal is provided by the comparison means; and

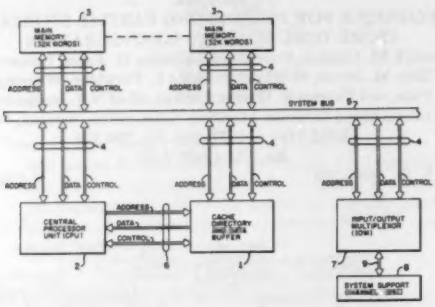
means responsive to said comparison means for performing a full store operation in main memory with the new word of data when a no-compare signal is provided by the comparison means.

4,157,587

HIGH SPEED BUFFER MEMORY SYSTEM WITH WORD PREFETCH

Thomas F. Joyce, Burlington, and Thomas O. Holtey, Newton Lower Falls, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 22, 1977, Ser. No. 863,095
Int. Cl.[2] G06F *9/00, 13/00;* G11C *9/00, 9/06*
U.S. Cl. 364—200 **20 Claims**



1. A data processing system comprising:

a system bus;

an addressable main memory coupled to said bus, said main memory including a plurality of sets of word locations, each set of word locations being defined by a column address, and each word location within a set being identified by a row address;

a cache unit coupled to said system bus, said cache unit comprising:

a data buffer including a plurality of word locations arranged in a plurality of sets of word locations defined by said column addresses:

a directory including a plurality of word locations corresponding in number to the number of sets in said data buffer and being addressable by said column address, each word location of said directory storing a row address of a corresponding one of said words of said set stored in said data buffer;

a central processor unit (CPU) coupled to said system bus;

an address register coupled to said system bus and to said CPU for receiving a fetch request address from said CPU;

address generating means coupled to said address register for generating successive addresses from said fetch request address;

a replacement address file (RAF) coupled to said CPU and said address generating means for receiving signals corresponding to said fetch request address and said successive addresses respectively;

comparing means operatively connected to said directory and to said CPU for comparing at least a portion of said fetch request address from said CPU with the row address read from said directory and generating a hit - no hit signal indicative of whether or not the word being requested is in said data buffer;

timing means coupled to said CPU for generating control signals in response to a cache request signal from said CPU for conditioning said address register and said RAF to store said fetch request address and required successive addresses during a memory request cycle of operations; and

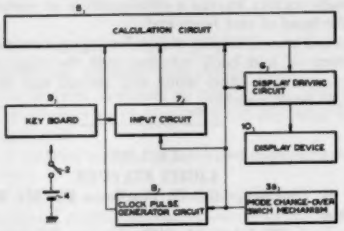
memory request means coupled to said timing means, and to said system bus and being responsive to said no hit signal, to said timing means and to a signal indicating that said main memory is busy, for transferring as part of a memory request said fetch request address and required successive addresses to said system bus for requesting words from said main memory when said main memory is not busy, said memory request means being conditioned by said signal indicating that said main memory is busy to repetitively apply said fetch request address to said system bus for transfer to said main memory.

4,157,588

MINIATURE TYPE ELECTRONIC DEVICE

Heihachiro Ebihara; Fukuo Sekiya, both of Tokorozawa, and Takashi Yamada, Sayama, all of Japan, assignors to Citizen Watch Co. Ltd., Tokyo, Japan

Filed Aug. 23, 1977, Ser. No. 826,985
Claims priority, application Japan, Sep. 2, 1976, 51-105254
Int. Cl.[2] G06F *7/38, 1/04*
U.S. Cl. 364—707 **9 Claims**



1. A miniature type electronic device having a calculation ability, comprising

(a) a mode change-over switch mechanism having an input and an output for changing over a calculation enable mode to a calculation disable mode and vice versa;

(b) a calculation circuit having a first input connected to said mode change-over switch mechanism and having second and third inputs, an output and including a plurality of volatile memory devices;

(c) an input circuit having a first input, a second input connected to the output of the mode change-over switch mechanism, a third input and an output connected to the second input of said calculation circuit;

(d) a key board having an output connected to the first input of said input circuit;

(e) a display driving circuit having a first input connected to the output of said calculation circuit and a second input connected to the output of the mode change-over switch mechanism and an output;

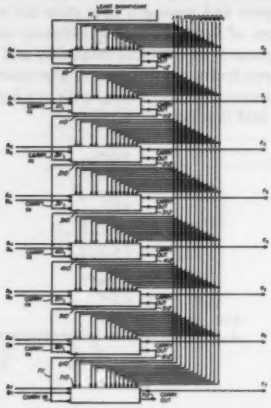
(f) a display device connected to the output of said display driving circuit; and

(g) a clock pulse generator circuit including a wave form shaping circuit having an input connected to the output of the mode change-over switch mechanism, a first output connected to the input of the mode change-over switch mechanism, a second output connected to the third input of the calculation circuit, and a third output connected to the third input of said input circuit, whereby when said mode change-over switch mechanism changes the calculation enable mode to the calculation disable mode, the power of a power supply is continuously applied to at least one of said volatile memory devices, the input circuit input from from said key board output is inhibited, and said display driving circuit input from said memory devices is inhibited so that the content of said memory device is not lost.

4,157,589
ARITHMETIC LOGIC APPARATUS

Christopher W. Kapral, Burlington, and Norman E. Heckman, Concord, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 9, 1977, Ser. No. 831,737
Int. Cl.[2] H03K 19/20; G06F 7/50
U.S. Cl. 364—716 10 Claims



1. A logical circuit comprising:

a first binary controlled switching circuit means having one select line, two data signal lines, and a single output line, said first means switching a signal on one or the other of said two data signal lines onto said output line dependent upon the binary state of a voltage level applied to said select line;

a secondary binary controlled switching circuit means having one select line, two data signal lines, and a single output line, said second means switching a signal on one or the other of said second means two data signal lines onto said second means output line dependent upon the binary state of a voltage level applied to said second means select line;

a third binary controlled switching circuit means having n select lines, 2^n data signal lines, and a single output line, said third means switching a signal on one of said third means 2^n data signal lines onto said third means output line dependent upon the binary state of voltage levels applied to said third means n select lines;

means coupling said first means output line to one of said third means select lines; and

means coupling said second means output line to a second of said third means select lines; wherein n is an integer greater than one.

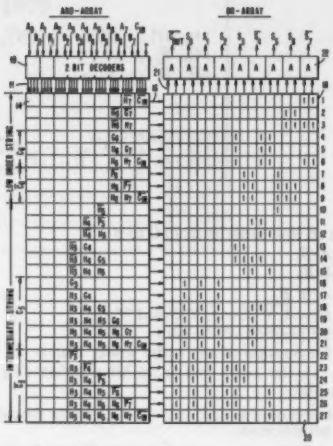
4,157,590
PROGRAMMABLE LOGIC ARRAY ADDER

Donald G. Grice, Kingston; David F. Johnson, Saugerties, and Arnold Weinberger, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,689
Int. Cl.[2] G06F 7/50
U.S. Cl. 364—787 10 Claims

1. In a carry look ahead adder for the addition of two multi digit numbers $A_0, A_1 \ldots A_{n-1}$ and $B_0, B_1 \ldots B_{n-1}$ with an input carry digit C_{in} to generate a multi digit binary sum $S_0, S_1, S_2 \ldots S_{n-1}$ and a carry out digit C_{out} using programmable logic arrays each with a plurality of two bit input decoders feeding signals to a product term generating array which in turn feeds signals to a sum of product term generating array that supplies signals to AND circuits providing an AND function of two inputs, the improvement comprising:

means feeding like order digits A_i, B_i of the two multi digit numbers to the same two bit input decoder; and



circuit means in the product term and sum of product term generating arrays providing inputs to one of said AND circuits to generate a sum digit S_i as the output of said one of the AND circuits in accordance with;

$$S_i = \begin{bmatrix} \overline{H}_i \cdot G_{i+1} \\ +\overline{H}_i \cdot H^*_{i+1} \cdot G_{i+2} \\ . \\ . \\ . \\ +\overline{H}_i \cdot H^*_{i+1} \cdot H^*_{i+2} \cdot \ldots \cdot H^*_{i+j-1} \cdot G_{i+j} \\ +H_i \cdot \overline{P}_{i+1} \\ +H_i \cdot H^{**}_{i+1} \cdot \overline{P}_{i+2} \\ . \\ . \\ . \\ +H_i \cdot H^{**}_{i+1} \cdot H^{**}_{i+2} \cdot \ldots \cdot H^{**}_{i+j-1} \cdot \overline{P}_{i+j} \\ +\overline{H}_i \cdot H_{i+1} \cdot \ldots \cdot H_{i+j} + C_{i+j+1} \end{bmatrix}$$

$$\begin{bmatrix} \overline{H}_i \cdot G_{i+1} \\ +\overline{H}_{i+1} \cdot H^*_{i+1} \cdot G_{i+2} \\ . \\ . \\ . \\ +\overline{H}_i \cdot H^*_{i+1} \cdot H^*_{i+2} \cdot \ldots \cdot H^*_{i+j-1} \cdot G_{i+j} \\ +H_i \cdot \overline{P}_{i+1} \\ +H_i \cdot H^{**}_{i+1} \cdot \overline{P}_{i+2} \\ . \\ . \\ . \\ +H_i \cdot H^{**}_{i+1} \cdot H^{**}_{i+2} \cdot \ldots \cdot H^{**}_{i+j-1} \cdot \overline{P}_{i+j} \\ +\overline{H}_i \cdot H_{i+1} \cdot \ldots \cdot H_{i+j} + \overline{C}_{i+j+1} \end{bmatrix}$$

and alternatively:

$$\overline{S}_i = \begin{bmatrix} H_i \cdot G_{i+1} \\ +H_i \cdot H^*_{i+1} \cdot G_{i+2} \\ . \\ . \\ . \\ +H_i \cdot H^*_{i+1} \cdot H^*_{i+2} \cdot \ldots \cdot H^*_{i+j-1} \cdot G_{i+j} \\ +\overline{H}_i \cdot \overline{P}_{i+1} \\ +\overline{H}_i \cdot H^{**}_{i+1} \cdot \overline{P}_{i+2} \\ . \\ . \\ . \\ +\overline{H}_i \cdot H^{**}_{i+1} \cdot H^{**}_{i+2} \cdot \ldots \cdot H^{**}_{i+j-1} \cdot \overline{P}_{i+j} \\ +H_i \cdot H_{i+1} \cdot \ldots \cdot H_{i+j} + \overline{C}_{i+j+1} \end{bmatrix}$$

-continued

$$\left[\begin{array}{l} H_i \cdot G_{i+1} \\ +H_i \cdot H^{*}_{i+1} \cdot G_{i+2} \\ . \\ . \\ . \\ +H_i \cdot H^{*}_{i+1} \cdot H^{*}_{i+2} \cdot \ldots \cdot H^{*}_{i+j-1} \cdot G_{i+j} \\ +\overline{H}_i \cdot \overline{P}_{i+1} \\ +\overline{H}_i \cdot H^{**}_{i+1} \cdot \overline{P}_{i+2} \\ . \\ . \\ . \\ +\overline{H}_i \cdot H^{**}_{i+1} \cdot H^{**}_{i+2} \cdot \ldots \cdot H^{**}_{i+j-1} \cdot \overline{P}_{i+j} \\ +\overline{H}_i \cdot H_{i+1} \cdot \ldots \cdot H_{i+j} + C_{i+j+1} \end{array}\right]$$

where:

High to low order is from 0 to n−1

$G_i = A_i B_i$

$\overline{P}_i = \overline{A}_i \overline{B}_i$

$H_i = A_i \veebar B_i$

$[H_i]\ \overline{H}_i = \overline{A_i \veebar B_i} = \overline{A}_i \veebar B_i = A \veebar B_i$

i=a bit position of the sum

j=a bit position of any order lower than i

C_{i+j+1}=the carry out from bit position i+j+1 into bit position i+j

*=substitution of an equivalent order P term for the indicated H term may be advantageous,

**=substitution of an equivalent order G term for the indicated H term may be advantageous.

4,157,591

MAGNETIC DOMAIN DEVICE

Evert H. L. J. Dekker; Willem F. Druyvesteyn; Franciscus A. Kuijpers, and Antonius G. H. Verhulst, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 28, 1976, Ser. No. 754,962

Claims priority, application Netherlands, Aug. 10, 1976, 7608861

Int. Cl.² G11C *19/08*

U.S. Cl. 365—19 **14 Claims**

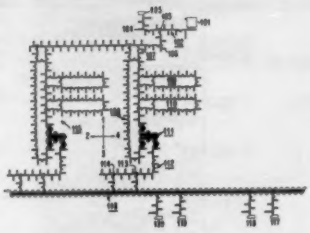
1. A magnetic bubble domain memory system comprising:

a plate of magnetic material capable of supporting magnetic bubble domains, including a first path for storing and propagating magnetic bubble domains, comprising a plurality of spaced apart magnetically operative discrete elements, and a second path for storing and transporting magnetic bubble domains comprising at least one current conductor having a spatially periodic disposition, and having terminals connected thereto;

interconnection means disposed between said first and second path for replicating magnetic bubble domains from a predetermined point on said first path to a predetermined point on said second path;

means coupled to said plate for generating magnetic bubble domains;

control means on said plate including first and second control outputs and having a first state for controlling the movement of magnetic bubble domains on said first and second paths at an identical frequency and a second state for independently controlling the movement of magnetic bubble domains on said second path at a higher frequency than on said first path;



drive means for driving said magnetic bubble domains along said paths, comprising first drive means connected to said first control output, including a magnetic field generator for generating a rotary magnetic field which rotates in the plane of said plate with a predetermined first frequency for driving said magnetic bubble domains along said first path, and second drive means connected to said second control output including a current generator and having current outputs for generating a periodically varying electric current with a predetermined second frequency higher than said first frequency for independently driving said magnetic bubble domains along said second path, said terminals on said second path being connected to said current outputs; and

detection means coupled to said plate for detecting the presence of magnetic bubble domains in a specific region of said plate.

DESIGN PATENTS

GRANTED JUN. 5, 1979

ERRATA

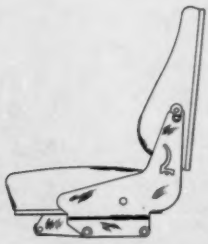
For CLASS	See PATENT NO.
D21–024	252,047
D21–234	252,048
D21–034	252,049
D21–228	252,050

DESIGNS

JUNE 5, 1979

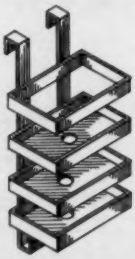
251,996
UTILITY BELT BUCKLE
Kenneth D. McKinney, Sr., Box 23A, Rte. 2, Apache Junction, Ariz. 85220, and Kenneth D. McKinney, Jr., 244 S. Lazona, Mesa, Ariz. 85204
Filed Jul. 5, 1977, Ser. No. 813,105
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—427

251,997
SEAT
Charles W. Pelly, Calabasas, Calif., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Jul. 11, 1977, Ser. No. 814,256
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48

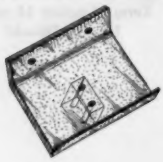


251,998
CHAIR OR SIMILAR ARTICLE
Albert M. Spound, Tarzana, Calif., and Robert C. Day, Princeton, Mass., assignors to Charlton Company, Inc., Leominster, Mass.
Continuation-in-part of Ser. No. 678,967, Apr. 21, 1976, abandoned. This application Jun. 23, 1978, Ser. No. 918,683
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

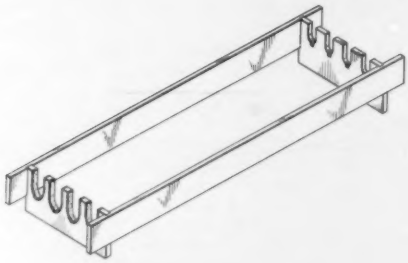
251,999
SHOWER DOOR CADDY
Macario D. Bautista, Jr., 8434 Colonial Dr., Stockton, Calif. 95209
Filed Mar. 15, 1978, Ser. No. 887,079
Term of patent 14 years
Int. Cl. D23—*02*; D6—*04*
U.S. Cl. D6—91



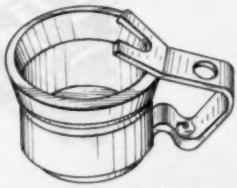
252,000
WALL MOUNTED SHELF OR THE LIKE
John H. Smith, III, 31 2nd Ave., Paterson, N.J. 07524, assignor to John Halsey Smith, III, Paterson, N.J.
Filed Jan. 19, 1978, Ser. No. 871,100
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—136



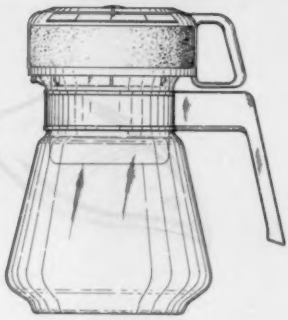
252,001
GUN RACK
Kevin H. Arnold, 2011 Basston, Creve Coeur, Mo. 63141
Filed Mar. 10, 1978, Ser. No. 885,462
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157



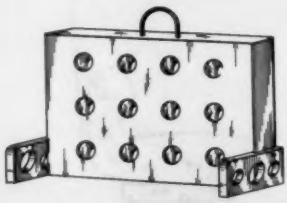
252,002
SHAVING MUG
Leonard J. Martini, 2801 Ocean Front Walk, F, San Diego, Calif. 92109
Filed Dec. 27, 1976, Ser. No. 754,455
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D7—9



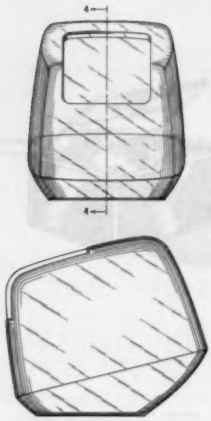
252,003
COFFEE MAKER
Masao Tsuji, North Plainfield, N.J., assignor to North American Philips Corporation, New York, N.Y.
Filed Apr. 25, 1977, Ser. No. 790,828
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—63



252,004
WINE BOTTLE DISPLAY RACK
Harold A. Leventhal, 405 E. 56 St., New York, N.Y. 10022
Filed May 16, 1977, Ser. No. 797,026
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D7—70



252,005
CANDY JAR
Robert J. Welch, West Chicago, Ill., assignor to Tootsie Roll Industries, Inc., Chicago, Ill.
Filed Jun. 6, 1977, Ser. No. 804,176
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—79

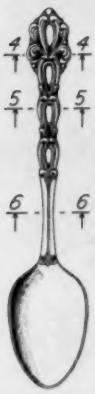


252,006
FISH SCALER
Mitsugu Noda, Dobbs Ferry, N.Y., and Robert G. Wilson, late of Dobbs Ferry, N.Y. (by Wilma J. Wilson, executrix), assignors to Mr. Fish Products Company, Dobbs Ferry, N.Y.
Filed Apr. 14, 1976, Ser. No. 676,924
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—106

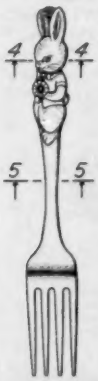
252,007
COOKING GRILL
Homer R. Morgan, 2765 Townley Cir., NE., Atlanta, Ga. 30340
Filed Jun. 30, 1977, Ser. No. 811,477
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—107

252,008
MICROWAVE OVEN ROASTING RACK
Calhoun G. Jeambey, 7013 Palm Dr., Des Moines, Iowa 50322
Filed Aug. 10, 1977, Ser. No. 823,549
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—129

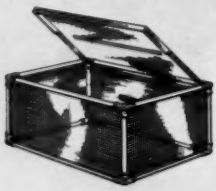
252,009
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to General Mills, Inc., Minneapolis, Minn.
Filed May 9, 1977, Ser. No. 794,870
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



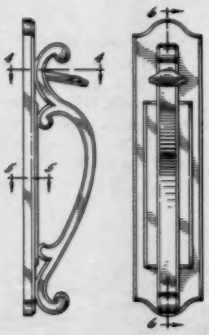
252,010
FORK OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to General Mills, Inc., Minneapolis, Minn.
Filed May 9, 1977, Ser. No. 794,871
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—144



252,011
TRASH BAG HOLDER
Vernon D. Permann, Bannock County, Id., and J. Grant Baldwin, Jr., Rte. 3, Juniperhill Rd., Pocatello, Id. 83201, assignors to said J. Grant Baldwin, Jr., Bannock County, Id.
Filed May 18, 1977, Ser. No. 797,930
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—194



252,012
COMBINED ENTRY HANDLE AND ESCUTCHEON
Teresa R. B. Pittenger, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed Jul. 17, 1978, Ser. No. 925,568
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—302



252,013
BOLT
Charles A. Casey, Huntington Beach, Calif., assignor to M G F Industries Corporation, Los Angeles, Calif.
Filed Mar. 10, 1977, Ser. No. 776,111
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—387

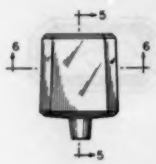
252,014
BOTTLE OR SIMILAR ARTICLE
Thomas A. Furlong, Wayne, N.J., and Adam J. Grodin, Forest Hills, N.Y., assignors to American Cyanamid Company, Stamford, Conn.
Filed Feb. 15, 1977, Ser. No. 769,136
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—117

252,015
BOTTLE OR SIMILAR ARTICLE
Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Feb. 15, 1977, Ser. No. 768,920
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168

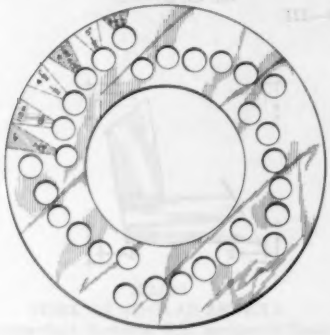
252,016
DISPLAY CARTON
Gary L. Adreon, Bourbonnais, Ill., assignor to Olinkraft, Inc., West Monroe, La.
Filed Apr. 14, 1977, Ser. No. 787,668
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—221

252,017
CONTAINER FOR NEWSPAPERS OR THE LIKE
Sarah J. Dumas, 300 Brentwood Dr. NE., Atlanta, Ga. 30305
Division of Ser. No. 450,326, Mar. 12, 1974, Pat. No. Des. 243,388. This application Feb. 7, 1977, Ser. No. 766,261
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—240

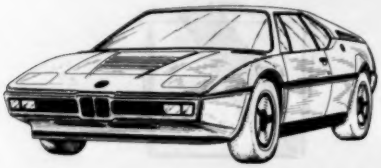
252,018
BOTTLE STOPPER
Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Oct. 21, 1977, Ser. No. 844,244
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254



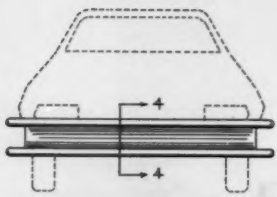
252,019
AUTOMOTIVE WHEEL CIRCLE TEMPLATE
Dennis W. O'Brien, 3608 Forest Hill Rd., Baltimore, Md. 20207
Filed Apr. 5, 1977, Ser. No. 784,802
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



252,020
AUTOMOBILE
Giorgetto Giugiaro, Moncalieri, Italy, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany
Filed Nov. 7, 1977, Ser. No. 849,434
Claims priority, application Fed. Rep. of Germany, May 6, 1977, 10973
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91



252,021
BUMPER
Cheston L. Eshelman, 621 NE. 30 Ter., Miami, Fla. 33137
Continuation-in-part of Ser. No. 806,015, Jun. 13, 1977, abandoned. This application Feb. 23, 1978, Ser. No. 880,860
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169



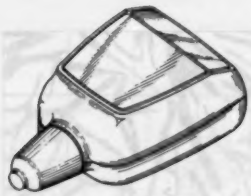
252,022
VEHICULAR MIRROR SUPPORT
Philip D. Stegenga, West Olive, Mich., assignor to Donnelly Mirrors, Inc., Holland, Mich.
Filed May 16, 1977, Ser. No. 797,021
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—187

252,023
SUN-VISOR FOR VEHICLES
Teddie W. Adams, P.O. Box 541, Blue Springs, Mo. 64015
Filed Feb. 27, 1978, Ser. No. 881,831
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—191

252,024
HOUSING FOR A MICROPHONE OR SIMILAR ARTICLE

Kazumasa Fujita, Iwaki, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

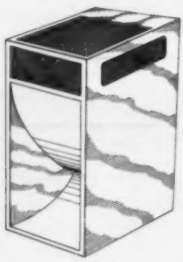
Filed Mar. 14, 1977, Ser. No. 777,267
Claims priority, application Japan, Dec. 25, 1976, 51-50508
Term of patent 14 years
Int. Cl. 14—*01*
U.S. Cl. D14—12



252,025
LOUDSPEAKER

Robert B. Welch, 3110 SE. Concord Rd., Milwaukie, Oreg. 97277, and Joseph W. Griffith, 8705 SW. White Ct., Portland, Oreg. 97225

Filed Mar. 17, 1977, Ser. No. 778,481
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33



252,026
ELECTRONIC PROCESSOR

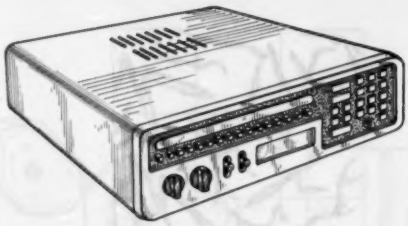
Richard R. Calverley, Chatsworth, Calif., assignor to Computer Kinetics Corporation, Westlake Village, Calif.

Filed Oct. 28, 1976, Ser. No. 736,434
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—42

252,027
DIGITAL ENTRY PROGRAMMABLE SCANNING RADIO RECEIVER

Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan

Filed Aug. 26, 1976, Ser. No. 718,046
Term of patent 14 years
Int. Cl. D14—*03, 02*
U.S. Cl. D14—72

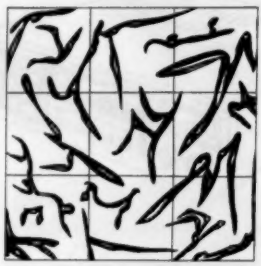


252,028
PEN

Alain Carré, Paris, France, assignor to Waterman S.A., Paris, France

Filed Apr. 7, 1977, Ser. No. 785,759
Claims priority, application France, Oct. 14, 1976, 75144
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—49

252,029
DESIGN FOR EDUCATIONAL AND/OR THERAPEUTIC GAME SET OR SIMILAR ARTICLE
Helen Popeck, 510 Myrtle Ave., Cheltenham, Pa. 19012
Filed Nov. 24, 1976, Ser. No. 744,747
Term of patent 7 years
Int. Cl. D19—*07*
U.S. Cl. D19—59



252,030
DESIGN FOR EDUCATIONAL AND/OR THERAPEUTIC GAME SET OR SIMILAR ARTICLE
Helen Popeck, 510 Myrtle Ave., Cheltenham, Pa. 19012
Filed Nov. 24, 1976, Ser. No. 744,749
Term of patent 7 years
Int. Cl. D19—*07*
U.S. Cl. D19—59

252,031
DESIGN FOR EDUCATIONAL AND/OR THERAPEUTIC GAME SET OR SIMILAR ARTICLE
Helen Popeck, 510 Myrtle Ave., Cheltenham, Pa. 19012
Filed Nov. 24, 1976, Ser. No. 744,803
Term of patent 7 years
Int. Cl. D19—*07*
U.S. Cl. D19—59

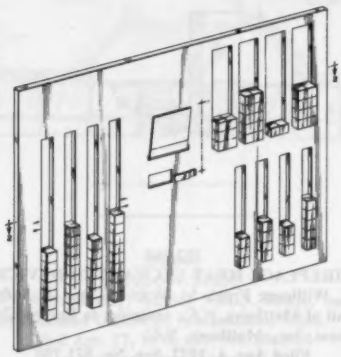
252,032
DESIGN FOR EDUCATIONAL AND/OR THERAPEUTIC GAME SET OR SIMILAR ARTICLE
Helen Popeck, 510 Myrtle Ave., Cheltenham, Pa. 19012
Filed Nov. 24, 1976, Ser. No. 744,804
Term of patent 7 years
Int. Cl. D19—*07*
U.S. Cl. D19—59

252,033

MATH TEACHING BOARD

Lawrence T. Restaino, 1453 Cottage Pl. NW., Canton, Ohio 44703

Filed Jun. 17, 1977, Ser. No. 807,593
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—59



252,035

COMBINATION LAVATORY BASIN AND TOILET BOWL

Earl L. Morris, Whittier, and Larry Fields, La Puente, both of Calif., assignors to Acorn Engineering Co., Industry, Calif.

Filed Oct. 3, 1977, Ser. No. 838,742
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49

252,034

PEN RECEPTACLE UNIT

William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.

Filed May 3, 1976, Ser. No. 682,585
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—84

252,036

COMBINATION LAVATORY BASIN AND TOILET BOWL

Earl L. Morris, Whittier, and Larry Fields, La Puente, both of Calif., assignors to Acorn Engineering Co., Industry, Calif.

Filed Oct. 3, 1977, Ser. No. 838,949
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49

252,037

COMBINATION LAVATORY BASIN AND TOILET BOWL

Earl L. Morris, Whittier, and Larry Fields, La Puente, both of Calif., assignors to Acorn Engineering Co., Industry, Calif.

Filed Oct. 3, 1977, Ser. No. 838,950

Term of patent 14 years

Int. Cl. D23—*02*

U.S. Cl. D23—49

252,038

COMBINATION LAVATORY BASIN AND TOILET BOWL

Earl L. Morris, Whittier, and Larry Fields, La Puente, both of Calif., assignors to Acorn Engineering Co., Industry, Calif.

Filed Oct. 3, 1977, Ser. No. 838,952

Term of patent 14 years

Int. Cl. D23—*02*

U.S. Cl. D23—49

252,039

COMBINATION LAVATORY BASIN AND TOILET BOWL

Earl L. Morris, Whittier, and Larry Fields, La Puente, both of Calif., assignors to Acorn Engineering Co., Industry, Calif.

Filed Oct. 3, 1977, Ser. No. 838,953

Term of patent 14 years

Int. Cl. D23—*02*

U.S. Cl. D23—49

252,040

COMBINATION LAVATORY BASIN AND TOILET BOWL

Earl L. Morris, Whittier, and Larry Fields, La Puente, both of Calif., assignors to Acorn Engineering Co., Industry, Calif.

Filed Oct. 3, 1977, Ser. No. 838,954

Term of patent 14 years

Int. Cl. D23—*02*

U.S. Cl. D23—49

252,041

FIREPLACE HEAT EXCHANGER DEVICE

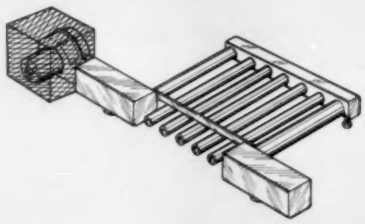
Robert L. Williams; Frank M. Williams, and J. Andrew Williams, all of Matthews, N.C., assignors to Energy Conserving Equipment, Inc., Matthews, N.C.

Filed Aug. 4, 1977, Ser. No. 821,780

Term of patent 14 years

Int. Cl. D23—*03;* D7—*08*

U.S. Cl. D23—94



252,042

HYDROTHERAPY POOL OR SIMILAR ARTICLE

Virgil J. Jacuzzi, Islington, and John D. Burgess, Loretto, both of Canada, assignors to Jacuzzi Bros., Inc., Canada

Filed Jul. 22, 1976, Ser. No. 708,111

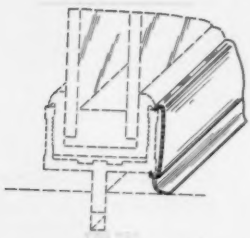
Term of patent 14 years

Int. Cl. D28—*03*

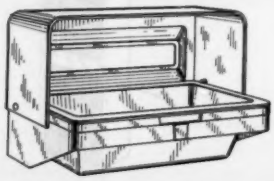
U.S. Cl. D24—38

252,043
RESTAURANT
Nicholaos Apostolos, 1714 N. Halifax Ave., Daytona Beach, Fla. 32018
Filed Jun. 15, 1977, Ser. No. 806,921
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22

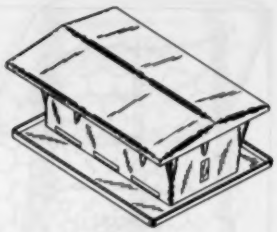
252,044
WINDOW TRIM
Roger D. O'Shaughnessy, Golden Valley, Minn., assignor to Cardinal Insulated Glass Co., Minneapolis, Minn.
Filed Apr. 17, 1978, Ser. No. 896,914
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



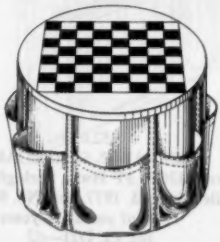
252,045
ASH TRAY
James R. Findlay, 4861 Arvilla Dr., S., Toledo, Ohio 43623
Filed Dec. 9, 1977, Ser. No. 859,087
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—14



252,046
BIRD FEEDER
Frank W. Beller, Aurora, Ill., assignor to Belson Manufacturing Co., Inc., Aurora, Ill.
Filed Aug. 10, 1978, Ser. No. 932,680
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15

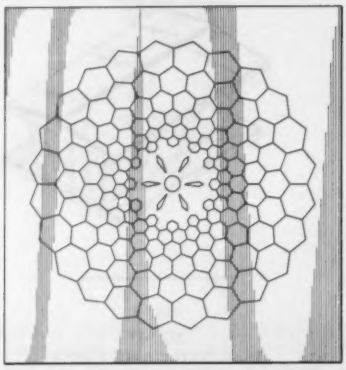


252,047
BEAN BAG GAME TABLE
Umberto J. Cirrone, 1774 Turnpost La., Hacienda Heights, Calif. 91745
Filed Apr. 25, 1977, Ser. No. 790,281
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—24

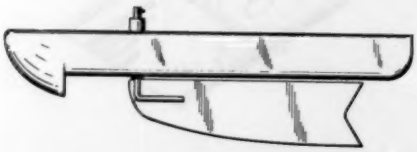


252,048
GOLF MAT
Earl Richards, 310 N. Lake Ave., Leesburg, Fla. 32748
Filed Jan. 10, 1977, Ser. No. 758,029
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234

252,049
GAME BOARD
Richard H. Recard, Jr., 213 Marshall St., Horseheads, N.Y. 14845
Filed Mar. 17, 1977, Ser. No. 778,625
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—34

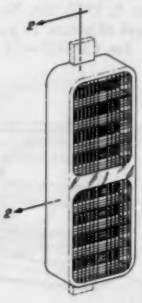


252,050
STEERABLE SURFBOARD
Vernon L. Stern, 2326 S. FF Hwy., Springfield, Mo. 65804
Filed Jun. 13, 1977, Ser. No. 806,259
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—228



252,051
LANTERN
Tang W. Luen, Kwun Tong, Kowloon, Hong Kong, assignor to Tang Fun Kee Manufacturing Company, Ltd., Kwun Tong, Kowloon, Hong Kong
Filed May 9, 1977, Ser. No. 795,376
Claims priority, application United Kingdom, Jan. 4, 1977, 978430/77
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R

252,052
PHOTOFLASH LAMP UNIT
Thomas A. Evans, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Oct. 17, 1977, Ser. No. 843,087
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D48—33



252,053
PHOTOFLASH LAMP UNIT

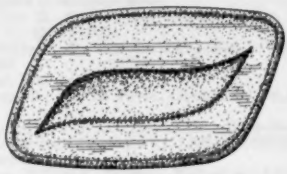
Thomas A. Evans, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 17, 1977, Ser. No. 843,089
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D48—33

252,054
SOAP BAR

John B. Carles, New Canaan, Conn., assignor to Bristol-Myers Company, New York, N.Y.

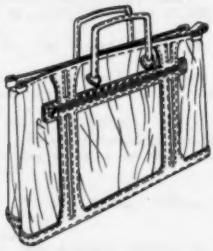
Filed Jul. 11, 1977, Ser. No. 814,248
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D73—1 A



252,055
CARRYING CASE

Sol Koffler, Providence, R.I., assignor to American Tourister, Inc.

Continuation-in-part of Ser. No. 711,802, Aug. 5, 1976. This application Jan. 21, 1977, Ser. No. 761,221
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71



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TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF JUNE, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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A/S Kongsberg Vapenfabrikk: *See*—
Rognmo, Tore, 4,157,068, Cl. 102-69.000.

Aberer, James B., to Rival Manufacturing Company. Fire ladder and method of constructing same. 4,157,130, Cl. 182-198.000.

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Aiba, Masahiko: *See*—
Takano, Rikuo; Ohota, Yutaka; Yamamoto, Yoichi; Sumitomo, Yuji; Kobayashi, Toshio; and Aiba, Masahiko, 4,157,551, Cl. 346-75.000.

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van den Berg, Gerrit H.; Pannekeet, Wilhelmus; Koerts, Kees; and Smakman, Robert, 4,157,298, Cl. 210-30.00R.
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Barton, Sterling C.; Carson, Chester C.; and Albert, Allen D., 4,157,040, Cl. 73-421.50R.

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Allan, James C., to Burroughs Corporation. Apparatus and method for controlling a tape drive to maintain a substantially constant linear tape velocity. 4,157,488, Cl. 318-7.000.

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Allen-Bradley Company: *See*—
Bollinger, Parker A., Jr.; and Frymark, Norbert F., 4,157,523, Cl. 337-56.000.

Allied Chemical Corporation: *See*—
Evans, Francis E.; Lind, Charles J.; Eibeck, Richard E.; and Robinson, Martin A., 4,157,377, Cl. 423-276.000.
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Alovyainikov, Alexandr A.: *See*—
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Reid, Martin J.; and Terry, Robert W., 4,157,550, Cl. 343-786.000.

Alten, Kurt. Guiding arrangement for closure bodies, especially roller doors, roller gates, and shutters. 4,156,953, Cl. 16-96.00R.

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Huempfner, David F.; Mueller, Floyd F.; and Kanzelberger, Claude G., 4,157,070, Cl. 108-28.000.

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Oros, Stefan, 4,157,540, Cl. 340-539.000.

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Halbert, Seymour P.; and Anken, Milton, 4,157,280, Cl. 195-127.000.

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Stock, Eberhard; and Taumann, Leonhard, 4,157,475, Cl. 250-503.000.

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West, Harold H., 4,157,072, Cl. 114-74.00R.

Archer, Jimmy D.: *See*—
Graham, Robert J.; and Archer, Jimmy D., 4,157,027, Cl. 72-403.000.

Arika, Junji; Takitani, Masaru; Mitarai, Keiji; and Yamamoto, Kazuaki, to Toyo Soda Manufacturing Co., Ltd. Process for producing chain structured corpuscular calcium carbonate. 4,157,379, Cl. 423-430.000.

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Asahi Denka Kogyo K. K.: *See*—
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Ogawa, Ryota, 4,157,212, Cl. 350-184.000.

Aspenwall, John E. Breech opening apparatus for handgun. 4,156,980, Cl. 42-44.000.

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Pampuch, Klaus, 4,157,091, Cl. 128-142.00R.

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Baer, Massimo, to Monsanto Company. Preparation of glass concentrate capsules for reinforcement of thermoplastics. 4,157,326, Cl. 260-42.180.

Bahr, Dietrich J.; and Burckardt, Karl H., to International Business Machines Corporation. Multiple-electrode print head for metal paper printers. 4,157,554, Cl. 346-163.000.

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Blanchard, Houston F., to General Motors Corporation. Sensor. 4,157,462, Cl. 200-61.45R.

Blastic, Douglas V. Golf score card and pencil holder. 4,157,152, Cl. 224-247.000.

Blaupunkt-Werke GmbH: *See*—
Riechmann, Werner, 4,157,487, Cl. 315-393.000.

Bleher, Fritz: *See*—
Wandel, Hermann; and Bleher, Fritz, 4,157,276, Cl. 162-348.000.

Blount, David H. Process for the production of poly(amine allyl halide) copolymer and their reaction products. 4,157,438, Cl. 528-392.000.

Bobo, Melvin; and Riedmiller, Charles F., to General Electric Company. Turbine shroud support. 4,157,232, Cl. 415-116.000.

Bock, Jan: *See*—
Lundberg, Robert D.; Makowski, Henry S.; Bock, Jan; and Zawadski, Thomas, 4,157,432, Cl. 526-31.000.

Bodenbenner, Kurt; Muller, Gerhard; and Muller, Heinrich, to Hoechst Aktiengesellschaft. Process for regeneration of sulfuric acid. 4,157,381, Cl. 423-525.000.

Bollinger, Parker A., Jr.; and Frymark, Norbert F., to Allen-Bradley Company. Bimetal overload relay. 4,157,523, Cl. 337-56.000.

Borg-Warner Corporation: *See*—
Salle, Ralph D., 4,157,136, Cl. 192-103.00B.

Bosselaar, Cornelis A., to U.S. Philips Corporation. Semiconductor device. 4,157,563, Cl. 357-53.000.

Bottali, Louis J.; Finger, Robert A.; and Gravereaux, Daniel W., to CBS Inc. Apparatus for cutting audio disks. 4,157,460, Cl. 179-100.40C.

Bourrain, Paul; and Giroud, Pierre, to Rhone-Poulenc-Textile. Adhesive-coating glass fibers and the resulting coated fibers. 4,157,420, Cl. 428-392.000.

Boutle, David L., to Porvair Limited. Production of porous materials. 4,157,424, Cl. 521-61.000.

Bowles Fluidics Corporation: *See*—
Bauer, Peter, 4,157,161, Cl. 239-11.000.

Boyan, Gerard E.: *See*—
Gordon, Robert; and Boyan, Gerard E., 4,157,218, Cl. 354-66.000.

Brady, Donnie G., to Phillips Petroleum Company. Bonding with a poly(arylene sulfide)-polytetrafluoroethylene adhesive. 4,157,273, Cl. 156-315.000.

Braton, Norman R.: *See*—
Wendt, Robert F.; Acker, Jan R.; and Braton, Norman R., 4,157,016, Cl. 62-123.000.

Brault, Yves; Carre, Roland; and Percy du Sert, Pierre, to Compagine Generale de Telegraphie Sans Fil. Variable frequency radar systems. 4,157,546, Cl. 343-17.20R.

Braunwieser, Johann: *See*—
Kralowetz, Bruno; Hojas, Hans; and Braunwieser, Johann, 4,157,026, Cl. 72-401.000.

Brennan, Martin: *See*—
Hunts, Barney D.; and Brennan, Martin, 4,157,539, Cl. 340-365.00C.

Brenner, Wolf, to Hoffmann-La Roche Inc. Process for the manufacture of a cyclopentenedione. 4,157,352, Cl. 260-586.00P.

Bristol-Meyers Company: *See*—
Crenshaw, Ronnie R.; Kavadias, Gerry; and Saintonge, Roger F., 4,157,340, Cl. 260-551.00C.

Bristol-Myers Company: *See*—
Crenshaw, Ronnie R.; and Luke, George M., 4,157,347, Cl. 260-551.00C.

British Petroleum Company Limited, The: *See*—
Bulford, Stanley N.; and Davies, Evan E., 4,157,356, Cl. 585-415.000.

Brodsky, Ralph H. Hygiene system. 4,157,093, Cl. 128-225.000.

Brois, Stanley J.: *See*—
Ryer, Jack; Miller, Harold N.; Zielinski, James; and Brois, Stanley J., 4,157,243, Cl. 44-63.000.

Brown, Stanley M.; and Woltermann, Gerald M., to Engelhard Minerals & Chemicals Corporation. Conversion of nitrogen oxides. 4,157,375, Cl. 423-239.000.

Browning, John H. D.: *See*—
Watson, Hugh R.; Rowsell, David G.; and Browning, John H. D., 4,157,384, Cl. 424-45.000.

Bruderhaus Machinen GmbH: *See*—
Strecker, Hubert, 4,157,177, Cl. 271-197.000.

Brunner, Mathias, to Zumbach Electronic AG. Apparatus and method for testing the thickness of the wall of a moving tube leaving an extruder. 4,157,503, Cl. 324-231.000.

Buchele, Karl, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Electronic heat amount meter. 4,157,034, Cl. 73-193.00R.

Buckman, John D.; Mercer, Gerald D.; and Pera, John D., to Buckman Laboratories, Inc. Process for preparing dimethylaminomethylenebis(phosphonic acid). 4,157,364, Cl. 260-976.000.

Buckman Laboratories, Inc.: *See*—
Buckman, John D.; Mercer, Gerald D.; and Pera, John D., 4,157,364, Cl. 260-976.000.

Budd, Tom A.: *See*—
Johnson, Eric A., III; Moore, Melvin E.; and Budd, Tom A., 4,157,274, Cl. 156-499.000.

Bujatti, Marina; Misiano, Carlo; and Simonetti, Enrico. Process to obtain conductive and resistive elements in microwave microcircuits. 4,157,284, Cl. 204-15.000.

Bulang, Siegfried: *See*—
Regehr, Ulrich; and Bulang, Siegfried, 4,157,250, Cl. 55-233.000.

Bulford, Stanley N.; and Davies, Evan E., to British Petroleum Company Limited, The. Process for aromatizing C_3–C_8 hydrocarbon feedstocks using a gallium containing catalyst supported on certain silicas. 4,157,356, Cl. 585-415.000.

Bunker Ramo Corporation: *See*—
Buszkiewicz, Bruno C.; and Storcel, Joseph A., 4,156,965, Cl. 29-754.000.

Burckardt, Karl H.: *See*—
Bahr, Dietrich J.; and Burckardt, Karl H., 4,157,554, Cl. 346-163.000.

Burg, Richard: *See*—
Delker, Wilfried; and Burg, Richard, 4,157,099, Cl. 137-625.170.

Burkhardt, Daniel F.; Evers, Carl A.; Kohnen, Anthony H.; Kohnen, Robert L.; Smith, Gary E.; and Wittman, Thomas J. Method and apparatus for reclaiming solvents from solvent-bearing sludge material. 4,157,281, Cl. 202-176.000.

Burroughs Corporation: *See*—
Allan, James C., 4,157,488, Cl. 318-7.000.
Tal, Jacob, 4,157,489, Cl. 318-606.000.

Burroway, Gary L.: *See*—
Feeney, George W.; and Burroway, Gary L., 4,157,319, Cl. 260-27.0BB.

Burzin, Klaus: *See*—
Rueter, Joern; Burzin, Klaus; Magosch, Karl-Heinz; and Feinauer, Roland, 4,157,330, Cl. 260-340.200.

Bush, Terry D.; and Denen, D. Joseph, to Floyd Bell Associates Inc. Electronic audio signalling device for telephones. 4,157,459, Cl. 179-84.00T.

Bushell, Patricia M.; and Bushell, Robert C. All-wheel-drive vehicle. 4,157,125, Cl. 180-26.00A.

Bushell, Robert C.: *See*—
Bushell, Patricia M.; and Bushell, Robert C., 4,157,125, Cl. 180-26.00A.

Busker, Leroy H.; and Sheng, Henry P., to Beloit Corporation. Electrostatic dry former. 4,157,236, Cl. 425-174.80E.

Buszkiewicz, Bruno C.; and Storcel, Joseph A., to Bunker Ramo Corporation. Semi-automatic contact insertion tool. 4,156,965, Cl. 29-754.000.

Cade, Paul E., to International Business Machines Corporation. Photo detector cell. 4,157,560, Cl. 357-30.000.

Cain, Ralph E., Jr.; and Crowell, Thomas J., to R. T. Engineering Service Inc. Digital panel meter. 4,157,501, Cl. 324-115.000.

California Institute of Technology: *See*—
Yen, Shiao-Ping S.; Rembaum, Alan; and Molday, Robert S., 4,157,323, Cl. 260-29.70M.

Callaway, James S.: *See*—
Partridge, Roger J.; and Callaway, James S., 4,156,956, Cl. 27-4.000.

Campbell, Richard A.: *See*—
Currie, James R.; Kissel, Ralph R.; Deaton, Emsley T., Jr.; and Campbell, Richard A., 4,156,971, Cl. 33-174.00L.

Canada, Her Majesty the Queen in right of: *See*—
Lusk, Norman E., 4,156,981, Cl. 42-63.000.

Canada Square Management Ltd.: *See*—
Swiderski, Kazimierz, 4,157,112, Cl. 165-2.000.

Canon Kabushiki Kaisha: *See*—
Tanaka, Kazuo; and Hirose, Ryusho, 4,157,211, Cl. 350-183.000.

Cantu, Arthur M.: *See*—
Koontz, Paul G.; Cantu, Arthur M.; and Wright, Richard L., 4,157,474, Cl. 250-480.000.

Carborundum Company, The: *See*—
Murty, Hari N., 4,157,314, Cl. 252-444.000.
Pickles, Allan E., 4,157,001, Cl. 52-506.000.

Carlo Erba S. p. A.: *See*—
Doria, Gianfederico; Giraldi, Piernicola; Lauria, Francesco; Corno, Maria L.; Sberze, Piero; and Tibolla, Marcello, 4,157,334, Cl. 260-345.200.

Carpenter, Lee G.; Cedro, Vito, III; and Kinosz, Donald L., to Aluminum Company of America. Disposal of waste gases from production of aluminum chloride. 4,157,374, Cl. 423-210.000.

Carpenter Technology Corporation: *See*—
Philip, Thoni V.; and Krieble, Robert W., 4,157,258, Cl. 75-124.000.

Carre, Roland: *See*—
Brault, Yves; Carre, Roland; and Percy du Sert, Pierre, 4,157,546, Cl. 343-17.20R.

Carson, Chester C.: *See*—
Barton, Sterling C.; Carson, Chester C.; and Albert, Allen D., 4,157,040, Cl. 73-421.50R.

Cassella Aktiengesellschaft: *See*—
Tappe, Horst, 4,157,446, Cl. 546-296.000.

Cataldo, Roy S., to General Motors Corporation. Run-flat tire having internal support means. 4,157,106, Cl. 152-158.000.

Cataldo, Roy S., to General Motors Corporation. Run-flat tire having integral internal support means. 4,157,107, Cl. 152-330.0RF.

Caterpillar Tractor Co.: *See*—
Day, Ralph R., 4,157,082, Cl. 123-136.000.

CBS Inc.: *See*—
Bottali, Louis J.; Finger, Robert A.; and Gravereaux, Daniel W., 4,157,460, Cl. 179-100.40C.

Cecka, Andrew M., to Fansteel Inc. Graphite fiber tapered shafts. 4,157,181, Cl. 273-80.00R.

Cedro, Vito, III: *See*—
Carpenter, Lee G.; Cedro, Vito, III; and Kinosz, Donald L., 4,157,374, Cl. 423-210.000.

Center for Design Research and Development N.V.: *See*—
Ambasz, Emilio, 4,157,203, Cl. 297-300.000.

Chan, Stanley S. C. Theft prevention starter system for a vehicle. 4,157,479, Cl. 307-10.0AT.

Chang, Eugene Y. C.; and Kaizerman, Samuel, to American Cyanamid Co. Polyurethanes stabilized against ultraviolet light and nitrogen oxide deterioration. 4,157,359, Cl. 260-849.000.

Charles, John J.; and Gasman, Robert C., to GAF Corporation. PBT molding compositions. 4,157,325, Cl. 260-40.00R.

Chauvier, Daniel J. V. D.: *See*—
Chauvier, Fernand L. O. J.; and Chauvier, Daniel J. V. D., 4,156,948, Cl. 15-1.700.

Chauvier, Daniel Jean Valere Denis: *See*—
Chauvier, Fernand L. O. J.; and Chauvier, Daniel J. V. D., 4,156,948, Cl. 15-1.700.

Chauvier, Fernand L. O. J.; and Chauvier, Daniel J. V. D., to Chauvier, Daniel Jean Valere Denis. Apparatus for cleaning submerged surfaces. 4,156,948, Cl. 15-1.700.

Cheek, Thomas B.; Doornink, Douglas J.; Handy, Roger M.; Heinen, David E.; Hubert, Joseph H.; and Wilson, Ronald J., to Tektronix, Inc. Display system utilizing digital-analog vector generation. 4,157,537, Cl. 340-706.000.

Chem-Y Fabriek van Chemische Produkten B.V.: *See*—
Dorrepaal, Wim; and Van den Haak, Gerardus M., 4,157,296, Cl. 209-167.000.

Chemap AG: *See*—
Muller, Hans, 4,157,305, Cl. 210-42.00S.

Chemische Werke Huels Aktiengesellschaft: *See*—
Rueter, Joern; Burzin, Klaus; Magosch, Karl-Heinz; and Feinauer, Roland, 4,157,330, Cl. 260-340.200.

Chemko Industries, Inc.: *See*—
Lynch, Patrick E., Jr., 4,156,952, Cl. 15-320.000.

Chevron Research Company: *See*—
Mitchell, David S.; and Sageman, David R., 4,157,245, Cl. 48-197.00R.
Wilgus, Donovan R.; and King, John M., 4,157,308, Cl. 252-42.700.
Wilgus, Donovan R.; and King, John M., 4,157,309, Cl. 252-42.700.

Chew, William M.: *See*—
Martignoni, Pasquale; Chew, William M.; Ayers, Orval E.; and Murfree, James A., Jr., 4,157,270, Cl. 149-109.600.

Chiba, Seibi: *See*—
Sakoe, Hiroaki; and Chiba, Seibi, 4,157,457, Cl. 179-1.0SA.

Chicago Pneumatic Tool Co.: *See*—
Amtsberg, Lester A.; and Bilodeau, Paul J., 4,157,121, Cl. 173-95.000.

Christ, Nicholas: *See*—
Sturwold, Robert J.; Utz, Walter E.; Christ, Nicholas; Ford, William R., Jr.; and Koch, George P., 4,157,422, Cl. 428-457.000.

Christenson, Lowell B. Method of assisting pile driving by electro-osmosis. 4,157,287, Cl. 204-180.00R.

Christiansen, Arvid, to Miranol Chemical Company, Inc., The. Hair and fabric conditioning compositions containing polymeric ionenes. 4,157,388, Cl. 424-70.000.

Christopher, Gordon W. Stabbing board assembly. 4,157,129, Cl. 182-82.000.

Chung, Daniel C.: *See*—
Prevorsek, Dusan C.; and Chung, Daniel C., 4,157,360, Cl. 260-860.000.

Cianci, James P.: *See*—
Peterson, James J.; and Cianci, James P., 4,157,043, Cl. 73-709.000.

Ciba-Geigy Corporation: *See*—
Fletcher, Ian J., 4,157,443, Cl. 544-254.000.

Citizen Watch Co. Ltd.: *See*—
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,157,588, Cl. 364-707.000.

Clark, Robert W., Jr. Differential pressure system for generating power. 4,157,014, Cl. 60-655.000.

Clavenna, LeRoy R.: *See*—
Eakman, James M.; and Clavenna, LeRoy R., 4,157,246, Cl. 48-197.00R.

Clevepak Corporation: *See*—
Molvar, Allen E., 4,157,304, Cl. 210-220.000.

Cline, Harvey E.: *See*—
Anthony, Thomas R.; and Cline, Harvey E., 4,157,564, Cl. 357-60.000.

Clough, Thomas J., to Atlantic Richfield Company. Phosphonamidic condensation reaction product. 4,157,339, Cl. 260-551.00P.

Cluett, Peabody & Co., Inc.: *See*—
Joy, Herman J., 4,156,955, Cl. 26-18.600.

Cobb, A. Lawrence, to Composite Technology Corporation. Composite foam structure. 4,157,416, Cl. 428-311.000.

Cobb, Bernie J., to United States of America, Army. Hypervelocity rocket system with velocity amplifier. 4,157,054, Cl. 89-8.000.

Coffey, Rufus T.: *See*—
Storrie, Robert C.; and Coffey, Rufus T., 4,156,950, Cl. 15-104.30R.

Colbrese, Nick P. Battery access system. 4,157,492, Cl. 320-25.000.

Colegrove, George T., to Merck & Co., Inc.,. Water diverting gel compositions. 4,157,322, Cl. 260-15.000.

Colgate Palmolive Company: *See*—
Tomlinson, Kenneth; and Duff, Edward J., 4,157,378, Cl. 423-301.000.

Collier, John P. High-strength porous prosthetic device and process for making the same. 4,156,943, Cl. 3-1.900.

Collins, John M.; and Mountain, Charles T., to Leer, Inc. Pick-up truck camper door assembly. 4,157,201, Cl. 296-156.000.

Collins, Robert H., III; and Love, Donald L., to Reserve Synthetic Fuels, Inc., by said Robert H. Collins, III. Corrosion control process. 4,157,247, Cl. 55-31.000.

Collonia, Harald. System for regulating the traveling speed of a motor vehicle. 4,157,126, Cl. 180-105.00E.

Colomer, Pierre, to Interfiltre, S. A. Self-cleaning filter device. 4,157,251, Cl. 55-242.000.

Combustion Engineering, Inc.: *See*—
Fernandes, John H., 4,157,368, Cl. 261-155.000.
Spencer, John D., 4,157,506, Cl. 328-6.000.

Commissariat a l'Energie Atomique: *See*—
Marmonier, Pierre; Moreau, Jean; and Nervi, Jean-Claude, 4,157,277, Cl. 176-19.00J.

Compagine Generale de Telegraphie Sans Fil: *See*—
Brault, Yves; Carre, Roland; and Percy du Sert, Pierre, 4,157,546, Cl. 343-17.20R.

Compagnie Generale d'Electricite: *See*—
Gadessaud, Robert, 4,157,423, Cl. 429-206.000.

Composite Technology Corporation: *See*—
Cobb, A. Lawrence, 4,157,416, Cl. 428-311.000.

Conan, Jean; Llauro nee Darricades, Marie-France; Bartholin, Michel; and Guyot, Alain, to Agence Nationale de Valorisation de la Recherche. Composite support notably for supporting catalysts containing a metal. 4,157,313, Cl. 252-431.00P.

Container Corporation of America: *See*—
Duncan, Ronnie D., 4,157,138, Cl. 206-315.00R.
Skaggs, Boyd T., 4,157,156, Cl. 229-15.000.
Young, Harry E., 4,157,157, Cl. 229-28.00R.

Continental Seafoods, Inc.: *See*—
Margus, Albert F., Jr., 4,157,061, Cl. 99-352.000.

Corcoran, Harold L.; Eichler, Kenneth M.; and Mandel, Alan F., to Westinghouse Electric Corp. Elevator system. 4,157,133, Cl. 187-29.00R.

Cordis Corporation: *See*—
Halbert, Seymour P.; and Anken, Milton, 4,157,280, Cl. 195-127.000.

Cornell, Robert J., to Uniroyal, Inc. ABS composition having improved impact strength and weather aging resistance and latex suspension process therefor. 4,157,361, Cl. 260-876.00R.

Corno, Maria L.: *See*—
Doria, Gianfederico; Giraldi, Piernicola; Lauria, Francesco; Corno, Maria L.; Sberze, Piero; and Tibolla, Marcello, 4,157,334, Cl. 260-345.200.

Costanzo, Francis X.; and Thau, Lawrence W., Jr., to Victaulic Company of America. Junction coupling for providing a fluid flow branch from a main conduit. 4,157,195, Cl. 285-4.000.

Costello, Edward C.: *See*—
Simon, David J.; and Costello, Edward C., 4,157,538, Cl. 340-347.0SY.

Coulter, Gerald R., to Halliburton Company. Process for reducing fluid flow to and from a zone adjacent a hydrocarbon producing formation. 4,157,116, Cl. 166-280.000.

Crane Packing Limited: *See*—
Kemp, John, 4,157,187, Cl. 277-87.000.

Crase, Gary M., to Smith International, Inc. Pressure compensating coupling for in hole motors. 4,157,022, Cl. 64-32.00R.

Crenshaw, Ronnie R.; Kavadias, Gerry; and Saintonge, Roger F., to Bristol-Meyers Company. N,N'-[Bis(N-cyanoguanyl)]cystamine derivatives. 4,157,340, Cl. 260-551.00C.

Crenshaw, Ronnie R.; and Luke, George M., to Bristol-Myers Company. N-cyano isothioureas. 4,157,347, Cl. 260-551.00C.

Creusot-Loire Enterprises: *See*—
Namy, Gerald, 4,157,249, Cl. 55-230.000.

Cronk, Byron W. Portable shelter. 4,157,098, Cl. 135-3.00R.

Crosby, Lawton H., to Morley Furniture Spring Corporation. Seat base rail connector and assembly. 4,157,172, Cl. 267-110.000.

Crosby, Lawton H., to Morley Furniture Spring Corporation. Seat base rail connector and assembly. 4,157,173, Cl. 267-110.000.

Crowell, Thomas J.: *See*—
Cain, Ralph E., Jr.; and Crowell, Thomas J., 4,157,501, Cl. 324-115.000.

Crown Controls Corporation: *See*—
Koeper, John I., 4,157,467, Cl. 235-92.0CT.

Culbertson, Harry M., to Monsanto Company. High ortho etherified resole resins admixed with coreactive resins. 4,157,324, Cl. 260-32.80R.

Currie, James R.; Kissel, Ralph R.; Deaton, Emsley T., Jr.; and Campbell, Richard A., to United States of America, National Aeronautics and Space Administration. Contour measurement system. 4,156,971, Cl. 33-174.00L.

Curtis, Hazen, III: *See*—
Bierman, Richard L.; and Curtis, Hazen, III, 4,157,165, Cl. 242-7.090.

Daikin Kogyo Co., Ltd.: *See*—
Horiuchi, Takeshi, 4,157,233, Cl. 417-218.000.

Dale Electronics, Inc.: *See*—
Person, Herman R., 4,157,543, Cl. 340-758.000.

D'Altroy, Frederick A.; Harrington, Daniel J.; and Miller, Gerald W., to Western Electric Company, Inc.; and Bell Telephone Laboratories, Incorporated. Gate controlled bidirectional semiconductor switching device having two base regions each having a different depth from an adjacent surface. 4,157,562, Cl. 357-39.000.

Danguillier, Wilhelm: *See*—
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,157,244, Cl. 48-62.00R.

Daravingas, George V.: *See*—
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,157,385, Cl. 424-48.000.

Datwyler, Max, to Max Datwyler & Co., Firma. Form cylinder provided with flexible printing plates for rotary intaglio printing presses. 4,157,067, Cl. 101-415.100.

Davies, Evan E.: *See*—
Bulford, Stanley N.; and Davies, Evan E., 4,157,356, Cl. 585-415.000.

Davies, John S. Multi-stage heat sensing cable and emergency communication system. 4,157,526, Cl. 337-415.000.

Davis, James E.: *See*—
Jaeger, Mark S.; and Davis, James E., 4,157,307, Cl. 252-8.750.

Davis, John W., to Radar Control Systems. Doppler radar module. 4,157,549, Cl. 343-786.000.

Day, Ralph R., to Caterpillar Tractor Co. Self-purging fuel supply system for internal combustion engines. 4,157,082, Cl. 123-136.000.

Deaton, Emsley T., Jr.: *See—*
Currie, James R.; Kissel, Ralph R.; Deaton, Emsley T., Jr.; and Campbell, Richard A., 4,156,971, Cl. 33-174.00L.

de Bayser, Pierre; and Mondoloni, Pierre, to Thomson-CSF. Band-pass filtering device with servo-controlled tuning. 4,157,515, Cl. 333-17.00R.

Decker, Bert J., deceased; and Decker, Jean S., executrix. Light weight tension-compression equilibrium structures. 4,156,997, Cl. 52-223.00R.

Decker, David R.; and Moon, Ronald L., to Varian Associates, Inc. Heterojunction confinement field effect transistor. 4,157,556, Cl. 357-22.000.

Decker, Jean S., executrix: *See—*
Decker, Bert J., deceased; and Decker, Jean S., executrix, 4,156,997, Cl. 52-223.00R.

Deere & Company: *See—*
Poore, Bernard B., 4,157,124, Cl. 180-105.00E.

DeForest, Laurence R.; and Richards, Frank P., to Phillips Petroleum Company. Container. 4,157,147, Cl. 220-455.000.

Dekker, Evert H. L. J.; Druyvesteyn, Willem F.; Kuijpers, Franciscus A.; and Verhulst, Antonius G. H., to U.S. Philips Corporation. Magnetic domain device. 4,157,591, Cl. 365-19.000.

Del Mar Avionics: *See—*
Shu, Stephen K., 4,157,571, Cl. 360-8.000.

Del Monte Corporation: *See—*
Ross, Edward E., 4,157,037, Cl. 73-304.00R.

Delker, Wilfried; and Burg, Richard, to American Standard Inc. Low noise faucet. 4,157,099, Cl. 137-625.170.

De Lorenzo, John F. Tubesheet with a thermal sleeve. 4,157,114, Cl. 165-158.000.

Delphian Corporation: *See—*
Zetter, Mark S., 4,157,283, Cl. 204-1.00T.

de Meulemeester, Jean C., to FMC Corporation. Hydraulic coupling device. 4,157,196, Cl. 285-18.000.

Deneau, Kenneth S., to Minnesota Mining and Manufacturing Company. Composite material for and method for forming graphics. 4,157,412, Cl. 428-147.000.

Denen, D. Joseph: *See—*
Bush, Terry D.; and Denen, D. Joseph, 4,157,459, Cl. 179-84.00T.

Dengyosha Machine Works, Ltd.: *See—*
Yoshikawa, Norihiro; and Suzuki, Ryoji, 4,157,303, Cl. 210-150.000.

Desai, Ashok K.; Gami, Bipinchandra V.; and Dunstan, Eric M., to Pertec Corporation. Electronic system for detecting direction of motion. 4,157,507, Cl. 328-134.000.

Deter, Burkhard, to Messerschmitt-Bolkow-Blohm GmbH. Electrical melting fuse combined with a Peltier element. 4,157,522, Cl. 337-4.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Junkermann, Helmut; and Hafner, Volker, 4,157,300, Cl. 210-40.000.

Devlin, Robert E.; and Janneck, Frank W., to General Motors Corporation. Clutch lock-up mechanism. 4,157,135, Cl. 192-53.00B.

Dexel, Michael: *See—*
Schreiber, Adam; Zollinger, Hans; and Dexel, Michael, 4,156,944, Cl. 3-1.910.

Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof. 4,157,449, Cl. 560-141.000.

Diamond Shamrock Corporation: *See—*
Gullo, James M.; Heilman, William P.; Wayner, Robert J.; and Moser, Robert E., 4,157,392, Cl. 424-249.000.

Diddens, Paul A., to Honeywell Inc. Recording electrode power limiting circuit for an electrographic recorder. 4,157,553, Cl. 346-154.000.

Dieck, Ronald L.; and Magnusson, Alan B., to Armstrong Cork Company. Catalytic process for the preparation of phosphazene polymers. 4,157,425, Cl. 521-95.000.

Dimension Weld International Corporation, The: *See—*
Kuroda, Minoru, 4,157,272, Cl. 156-219.000.

Dixi S.A. Usine 2: *See—*
Haller, Friedrich, 4,156,962, Cl. 29-568.000.

Dobbs, James C., to George H. Elliott Company. Fat recovery system. 4,157,335, Cl. 260-412.600.

Dr. C. Otto & Comp. GmbH.: *See—*
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,157,244, Cl. 48-62.00R.

Dr. Otto C. Strecker KG.: *See—*
Strecker, Hubert, 4,157,177, Cl. 271-197.000.

Doi, Kouichi, to Japan Crown Cork Co., Ltd. Sales promoting-purpose bottle closure. 4,157,143, Cl. 215-228.000.

Doll, Friedhelm; and Rolff, Jacob. Inductive flow meter. 4,157,035, Cl. 73-194.0EM.

Domokos, Jozsef: *See—*
Benedek, Gyorgy; Bese, Andras; Domokos, Jozsef; and Kovacs, Istvan, 4,157,162, Cl. 239-707.000.

Donofrio, John D., to Joanna Western Mills Company. Shade roller assembly. 4,157,108, Cl. 160-263.000.

Doornink, Douglas J.: *See—*
Cheek, Thomas B.; Doornink, Douglas J.; Handy, Roger M.; Heinen, David E.; Hubert, Joseph H.; and Wilson, Ronald J., 4,157,537, Cl. 340-706.000.

Doria, Gianfederico; Giraldi, Piernicola; Lauria, Francesco; Corno, Maria L.; Sberze, Piero; and Tibolla, Marcello, to Carlo Erba S. p. A. 6-Carboxy-flavone derivatives and process for their preparation. 4,157,334, Cl. 260-345.200.

Dorrepaal, Wim; and Van den Haak, Gerardus M., to Chem-Y Fabriek van Chemische Produkten B.V. Flotation process for fluoride minerals. 4,157,296, Cl. 209-167.000.

Dow Corning Corporation: *See—*
Austad, Eric D., 4,157,085, Cl. 128-1.00R.

Doyle, William D., to Felt Products Mfg. Co. Novel sealing assembly and method therefor. 4,157,369, Cl. 264-240.000.

Dragerwerk Aktiengesellschaft: *See—*
Fleckenstein, Wolfgang; and Rinne, Helmut, 4,157,288, Cl. 204-195.00P.

Dremin, Vladimir G.: *See—*
Vydrin, Vladimir N.; Berezin, Evgeny N.; Dremin, Vladimir G.; Tischenko, Oleg I.; and Serebrennikov, Gennady Z., 4,157,025, Cl. 72-189.000.

Dresser Industries, Inc.: *See—*
Randall, Russel R., 4,157,469, Cl. 250-262.000.

Droll, Ronald W.: *See—*
Orlando, Franklin P.; and Droll, Ronald W., 4,157,005, Cl. 56-228.000.

Druyvesteyn, Willem F.: *See—*
Dekker, Evert H. L. J.; Druyvesteyn, Willem F.; Kuijpers, Franciscus A.; and Verhulst, Antonius G. H., 4,157,591, Cl. 365-19.000.

DuBell, Thomas L., to General Electric Company. Gaseous fuel delivery system. 4,157,012, Cl. 60-39.46G.

Dudley, Alex. Hand saw work holder. 4,157,047, Cl. 76-76.000.

Duff, Edward J.: *See—*
Tomlinson, Kenneth; and Duff, Edward J., 4,157,378, Cl. 423-301.000.

Duncan, Ronnie D., to Container Corporation of America. Wrapper for an article of merchandise. 4,157,138, Cl. 206-315.00R.

Dunstan, Eric M.: *See—*
Desai, Ashok K.; Gami, Bipinchandra V.; and Dunstan, Eric M., 4,157,507, Cl. 328-134.000.

Du Pont de Nemours, E. I., and Company: *See—*
Feiring, Andrew E., 4,157,344, Cl. 260-575.000.
Hammer, Clarence F., 4,157,428, Cl. 521-134.000.
Mirhej, Michael E., 4,157,419, Cl. 428-373.000.
Peiffer, Robert W., 4,157,407, Cl. 427-54.000.

DuVall, Dale R., to Recognition Equipment Incorporated. Independent channel automatic gain control for self-scanning photocell array. 4,157,533, Cl. 340-146.3AG.

Eakman, James M.; and Clavenna, LeRoy R., to Exxon Research & Engineering Co. Hydrothermal alkali metal catalyst recovery process. 4,157,246, Cl. 48-197.00R.

Eastman Kodak Company: *See—*
Hines, Stephen P., 4,157,214, Cl. 353-70.000.

Eberlein, Dietmar: *See—*
Schultes, Max; and Eberlein, Dietmar, 4,157,059, Cl. 93-93.00C.

Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, to Citizen Watch Co. Ltd. Miniature type electronic device. 4,157,588, Cl. 364-707.000.

Ecklor, Edward, Jr. Arm exercising device. 4,157,179, Cl. 272-67.000.

Edgar, Richard H.: *See—*
Smith, William V.; Gilliatt, Charles L.; and Edgar, Richard H., 4,157,464, Cl. 219-10.55R.

Edwards, Colin R., to National Research Development Corporation. Inverters and logic gates employing inverters. 4,157,480, Cl. 307-203.000.

Eggler, James F.: *See—*
Bindra, Jasjit S.; Eggler, James F.; Johnson, Michael R.; and Schaaf, Thomas K., 4,157,341, Cl. 260-559.00B.

Eibeck, Richard E.: *See—*
Evans, Francis E.; Lind, Charles J.; Eibeck, Richard E.; and Robinson, Martin A., 4,157,377, Cl. 423-276.000.

Eichler, Kenneth M.: *See—*
Corcoran, Harold L.; Eichler, Kenneth M.; and Mandel, Alan F., 4,157,133, Cl. 187-29.00R.

Eisai Co., Ltd.: *See—*
Tanaka, Satoru; and Munakata, Keiichi, 4,157,396, Cl. 424-266.000.

Eisen, Fred H.; Zucca, Ricardo; and Welch, Bryant, to Rockwell International Corporation. Qualification test of gallium arsenide. 4,157,497, Cl. 324-62.000.

Emelyanov, Valentin P.: *See—*
Pershin, Gennady D.; Emelyanov, Valentin P.; and Schegolev, Gennady K., 4,157,102, Cl. 140-149.000.

Emerson Electric Co.: *See—*
Grable, Jack W., 4,157,525, Cl. 337-343.000.

Emery Industries, Inc.: *See—*
Sturwold, Robert J.; Utz, Walter E.; Christ, Nicholas; Ford, William R., Jr.; and Koch, George P., 4,157,422, Cl. 428-457.000.

Emmons Guitar Company, Inc.: *See—*
Lashley, Ronald T., 4,157,050, Cl. 84-312.00P.

Endo, Seiji; Kashihara, Takao; Osako, Akitada; Shizuki, Tatsuhiko; and Ikegami, Tadashi, to Toyo Boseki Kabushiki Kaisha. Phosphorus-containing polyesters. 4,157,436, Cl. 528-167.000.

Energy and Minerals Research Co.: *See—*
Tarpley, William B., Jr., 4,157,242, Cl. 44-7.00D.

Engel, John F., to FMC Corporation. Insecticidal (β-phenylvinyl)cyclopropanecarboxylates. 4,157,397, Cl. 424-274.000.

Engel, John F., to FMC Corporation. Intermediates for insecticidal (β-phenyl-β-substituted-vinyl)cyclopropanecarboxylates. 4,157,447, Cl. 560-8.000.

Engelhard Minerals & Chemicals Corporation: *See—*
Brown, Stanley M.; and Woltermann, Gerald M., 4,157,375, Cl. 423-239.000.
Hollander, Orin, 4,157,275, Cl. 162-146.000.

Thompson, Charles E.; Mooney, John J.; Keith, Carl D.; and Mannion, William A., 4,157,316, Cl. 252-462.000.

Envirotech Corporation: *See*—
Wegener, Willi A., 4,157,301, Cl. 210-404.000.

Erickson, Waldo C.: *See*—
Grover, R. Kumar; and Erickson, Waldo C., 4,156,988, Cl. 49-390.000.

Ernst, Rossler: *See*—
Hrachowitz, Frank; Ernst, Rossler; and Svoboda, Josef, 4,157,192, Cl. 280-618.000.

Escher Wyss Limited: *See*—
Miesch, Hans, 4,156,958, Cl. 29-116.0AD.

ETA A.G. Ebauches-Fabrik: *See*—
Perrot, Friedrich, 4,157,008, Cl. 58-107.000.

Ethicon, Inc.: *See*—
Okuzumi, Yuzi; Mellon, A. Darline; and Wasserman, David, 4,157,437, Cl. 528-354.000.

Ethyl Corporation: *See*—
Raley, Garland E., 4,157,237, Cl. 425-363.000.

Eubank, William J. Grout saw. 4,156,966, Cl. 30-166.00R.

Evans, Edwin R., to General Electric Company. Process for the polymerization of cyclic diorganopolysiloxanes with cation-complex catalysts. 4,157,337, Cl. 260-448.20E.

Evans, Francis E.; Lind, Charles J.; Eibeck, Richard E.; and Robinson, Martin A., to Allied Chemical Corporation. Process for producing calcium fluoborate. 4,157,377, Cl. 423-276.000.

Evans, Hugh N.: *See*—
Beardmore, Geoffrey; and Evans, Hugh N., 4,157,465, Cl. 219-121.0EM.

Everest & Jennings, Inc.: *See*—
Rodaway, Keith S., 4,157,123, Cl. 180-6.500.

Evers, Carl A.: *See*—
Burkhardt, Daniel F.; Evers, Carl A.; Kohnen, Anthony H.; Kohnen, Robert L.; Smith, Gary E.; and Wittman, Thomas J., 4,157,281, Cl. 202-176.000.

Exxon Research & Engineering Co.: *See*—
Eakman, James M.; and Clavenna, LeRoy R., 4,157,246, Cl. 48-197.00R.
Lundberg, Robert D.; Makowski, Henry S.; Bock, Jan; and Zawadski, Thomas, 4,157,432, Cl. 526-31.000.
Ryer, Jack; Miller, Harold N.; Zielinski, James; and Brois, Stanley J., 4,157,243, Cl. 44-63.000.

Fairbrother, Robert J.: *See*—
Lines, Ellwood L.; Fairbrother, Robert J.; and Herbst, John A., 4,157,346, Cl. 260-348.310.

Fansteel Inc.: *See*—
Cecka, Andrew M., 4,157,181, Cl. 273-80.00R.

Fare, Angelo; and Fumagalli, Giovanni, to Hoffmann-La Roche Inc. Direct-acting respirator. 4,157,092, Cl. 128-145.600.

Farmitalia Carlo Erba S.p.A.: *See*—
Maiorano, Michele; Valentini, Luigi; and Praga, Claudio, 4,157,086, Cl. 128-637.000.

Favre, Marcel. Adjustable support for a high jump bar. 4,157,180, Cl. 272-103.000.

Feeney, George W.; and Burroway, Gary L., to Goodyear Tire & Rubber Company, The. Adhesive composition and butadiene, styrene, acrylonitrile copolymer therefor. 4,157,319, Cl. 260-27.0BB.

Fegley, Charles R., to Western Electric Company, Inc. Electroluminescent display and circuit protective device and method of making. 4,157,486, Cl. 315-71.000.

Feinauer, Roland: *See*—
Rueter, Joern; Burzin, Klaus; Magosch, Karl-Heinz; and Feinauer, Roland, 4,157,330, Cl. 260-340.200.

Feiring, Andrew E., to Du Pont de Nemours, E. I., and Company. Preparation of aryl trifluoromethyl ethers. 4,157,344, Cl. 260-575.000.

Felt Products Mfg. Co.: *See*—
Doyle, William D., 4,157,369, Cl. 264-240.000.

Fentron Industries, Inc.: *See*—
Grover, R. Kumar; and Erickson, Waldo C., 4,156,988, Cl. 49-390.000.

Ferber, George, to General Motors Corporation. Method for entraining gas in a liquid chemical precursor for reaction injection molding. 4,157,427, Cl. 521-133.000.

Fernandes, John H., to Combustion Engineering, Inc. Vortex cooling tower. 4,157,368, Cl. 261-155.000.

Fiala, Dennison F.: *See*—
Gaines, Robert W.; Fiala, Dennison F.; and Babcock, Henry N., 4,157,263, Cl. 106-89.000.

Fiala, Ernst, to Volkswagenwerk Aktiengesellschaft. Apparatus for indicating the fuel consumption rate of an internal combustion engine. 4,157,031, Cl. 73-113.000.

Field, Donald E.; and Griffith, James R., to United States of America, Navy. Fluorinated network polymers. 4,157,358, Cl. 260-836.000.

Fields, Joseph E.; and Slocombe, Robert J., to Monsanto Company. Separation of blood coagulation factors with non-activating polyelectrolytes. 4,157,431, Cl. 526-15.000.

Finger, Robert A.: *See*—
Bottali, Louis J.; Finger, Robert A.; and Gravereaux, Daniel W., 4,157,460, Cl. 179-100.40C.

Firestone Tire & Rubber Company, The: *See*—
Hergenrother, William L.; Schwarz, Richard A.; Ambrose, Richard J.; and Hayes, Robert A., 4,157,429, Cl. 521-137.000.
Hergenrother, William L.; Schwarz, Richard A.; Ambrose, Richard J.; and Hayes, Robert A., 4,157,430, Cl. 521-137.000.

Firmenich, S.A.: *See*—
Ohloff, Gunther; and Giersch, Wolfgang K., 4,157,451, Cl. 569-875.000.

Fisons Limited: *See*—
Gates, Peter S.; Gillon, John; and Saggers, David T., 4,157,255, Cl. 71-76.000.

Fitton, Peter; Rick, Edward A.; and Weinberg, Kurt, to Union Carbide Corporation. Method for the preparation of quinoline and aniline compounds. 4,157,445, Cl. 546-181.000.

Fleckenstein, Albrecht; Janke, Johanna; Lossnitzer, Klaus; and Voelger, Karl-Dieter, to Rohm Pharma GmbH. Cardio-protective pharmaceutical composition. 4,157,394, Cl. 424-251.000.

Fleckenstein, Wolfgang; and Rinne, Helmut, to Dragerwerk Aktiengesellschaft. Polarographic measuring probe with diffusion film membrane. 4,157,288, Cl. 204-195.00P.

Fletcher, Ian J., to Ciba-Geigy Corporation. v-Triazolyl-[4,5-d]-pyrimidines. 4,157,443, Cl. 544-254.000.

Floryan, Daniel E.; and Fox, Daniel W., to General Electric Company. Process for removing metal-EDTA complex and free EDTA salts from mixed aqueous-organic media. 4,157,434, Cl. 526-71.000.

Flournoy, Kenoth H.: *See*—
Kalfoglou, George; and Flournoy, Kenoth H., 4,157,306, Cl. 252-8.55D.

Floyd Bell Associates Inc.: *See*—
Bush, Terry D.; and Denen, D. Joseph, 4,157,459, Cl. 179-84.00T.

FMC Corporation: *See*—
de Meulemeester, Jean C., 4,157,196, Cl. 285-18.000.
Engel, John F., 4,157,397, Cl. 424-274.000.
Engel, John F., 4,157,447, Cl. 560-8.000.
Orlando, Franklin P.; and Droll, Ronald W., 4,157,005, Cl. 56-228.000.

Fokina, Natalia A.: *See*—
Vulikh, Alexandr I.; Zagorskaya, Maina K.; Fokina, Natalia A.; Nikandrov, Gennady A.; Reznichenko, Lidia A.; Zverev, Mikhail P.; Barash, Arkady N.; Surkova, Valentina I.; Mavrin, Alexei M.; Troyan, Nikolai V.; Kalyanova, Nadezhda F.; Shimko, Ivan G.; Alovyainikov, Alexandr A.; and Pechalin, Lev I., 4,157,376, Cl. 423-240.000.

Ford, William R., Jr.: *See*—
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Foster, Jack V., to AMF Incorporated. Start lead dampeners on coil bobbin. 4,157,519, Cl. 336-192.000.

Fox, Daniel W.: *See*—
Floryan, Daniel E.; and Fox, Daniel W., 4,157,434, Cl. 526-71.000.

Frame, Robert R., to UOP Inc. Catalytic composite particularly useful for the oxidation of mercaptans contained in a sour petroleum distillate. 4,157,312, Cl. 252-428.000.

Freeman, Jerry H. Light fixture. 4,157,585, Cl. 362-248.000.

Freimark, Ronald J.; and Isaacson, Robert E., to Tenna Corporation. Splitter for antenna for AM-FM, CB and method of conversion. 4,157,547, Cl. 343-180.000.

Frimley, Charles H., to Trico Products Corporation. Brush mounting for dynamo-electric machine. 4,157,483, Cl. 310-242.000.

Fryer, Rodney I.: *See*—
Gilman, Norman; and Fryer, Rodney I., 4,157,331, Cl. 260-239.30T.

Frymark, Norbert F.: *See*—
Bollinger, Parker A., Jr.; and Frymark, Norbert F., 4,157,523, Cl. 337-56.000.

Fuchs, Gyula S., to Nagy, Lou. Atomizing device for carburetors. 4,157,367, Cl. 261-121.00A.

Fuji Photo Film Co., Ltd.: *See*—
Ikenoue, Shinpei; and Masuda, Takao, 4,157,289, Cl. 204-195.00F.
Kubotera, Kikuo; Kashiwabara, Akira; Sato, Kotaro; Ono, Hisatake; Sato, Hideo; and Mizobuchi, Yuzo, 4,157,262, Cl. 96-29.00R.
Takeda, Keiji, 4,157,261, Cl. 96-28.000.

Fujita, Teizo, to Izumi Denki Corporation. Switch apparatus. 4,157,463, Cl. 200-307.000.

Fujitsu Limited: *See*—
Nawata, Yoshiaki; Kobayashi, Masaaki; Yajima, Kazuo; Iwasawa, Shigeo; and Takahashi, Koji, 4,157,561, Cl. 357-36.000.

Fukinbara, Itaru: *See*—
Yano, Nobumitsu; Fukinbara, Itaru; and Takano, Mitsuo, 4,157,404, Cl. 426-429.000.

Fukumura, Tohru: *See*—
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Fumagalli, Giovanni: *See*—
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Furman, Anatoly V.: *See*—
Kornienko, Marat I.; Furman, Anatoly V.; Podboronov, Boris P.; and Shevchuk, Vyacheslav V., 4,157,494, Cl. 323-79.000.

Gadessaud, Robert, to Compagnie Generale d'Electricite. Battery containing an alkaline electrolyte. 4,157,423, Cl. 429-206.000.

GAF Corporation: *See*—
Charles, John J.; and Gasman, Robert C., 4,157,325, Cl. 260-40.00R.

Gaines, Robert W.; Fiala, Dennison F.; and Babcock, Henry N., to U.S. Grout Corporation. Cementitious compositions having fast-setting properties and inhibited shrinkage. 4,157,263, Cl. 106-89.000.

Gale, Michael T.; and Knop, Karl, to RCA Corporation. Technique for recording micropicture-information on a diffractive subtractive filter embossing master. 4,157,220, Cl. 355-19.000.

Gami, Bipinchandra V.: *See—*
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Gannon, Patrick M.; Jones, Julius D.; Junod, Dale M.; Partridge, Richard L.; and Wright, Thomas R., to International Business Machines Corporation. Technique for performing partial stores in store-thru memory configuration. 4,157,586, Cl. 364-200.000.
Gansley, Byron J., to Harold Phelps. Portable log splitter. 4,157,105, Cl. 144-193.00A.
Gardner nee Marshall, Monica J.: *See—*
Ross, Gordon W.; Gardner nee Marshall, Monica J.; and Wolff, Walter, 4,157,278, Cl. 195-4.000.
Gasman, Robert C.: *See—*
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Gates, Peter S.; Gillon, John; and Saggers, David T., to Fisons Limited. Herbicides. 4,157,255, Cl. 71-76.000.
Gauthier, Gerard, to Thomson-CSF. Synchronous transmission device of the vernier resolver type incorporating compensation of parasitic coupling. 4,157,536, Cl. 340-198.000.
Geflugelschlachterei Gebr. Stolle, Firma: *See—*
Kamphaus, Josef, 4,157,003, Cl. 53-572.000.
Geisen, Karl: *See—*
Hitzel, Volker; Weyer, Rudi; Pfaff, Werner; and Geisen, Karl, 4,157,395, Cl. 424-266.000.
General Electric Company: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,157,564, Cl. 357-60.000.
Barnes, David A., 4,157,153, Cl. 228-136.000.
Barton, Sterling C.; Carson, Chester C.; and Albert, Allen D., 4,157,040, Cl. 73-421.50R.
Basmajian, Fred J.; and Kurtz, Ronald C., 4,157,583, Cl. 361-388.000.
Beck, William J., Jr.; and Barrett, David M., 4,157,472, Cl. 250-445.00T.
Bobo, Melvin; and Riedmiller, Charles F., 4,157,232, Cl. 415-116.000.
DuBell, Thomas L., 4,157,012, Cl. 60-39.46G.
Evans, Edwin R., 4,157,337, Cl. 260-448.20E.
Floryan, Daniel E.; and Fox, Daniel W., 4,157,434, Cl. 526-71.000.
McMillan, Stephen L., 4,157,042, Cl. 74-230.17E.
O'Connor, Richard A., 4,157,476, Cl. 250-520.000.
Orth, Edward D.; and Schultz, William J., 4,157,311, Cl. 252-408.000.
Philipp, Herbert R., 4,157,527, Cl. 338-21.000.
Sailer, Edward D., 4,157,010, Cl. 60-39.040.
Sutter, Ormond S., 4,157,000, Cl. 52-489.000.
General Mills, Inc.: *See—*
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,157,385, Cl. 424-48.000.
General Mills U.K. Limited: *See—*
Viner, Peter, 4,156,985, Cl. 46-44.000.
General Motors Corporation: *See—*
Bell, Albert H., III, 4,157,013, Cl. 60-39.51H.
Blanchard, Houston F., 4,157,462, Cl. 200-61.45R.
Cataldo, Roy S., 4,157,106, Cl. 152-158.000.
Cataldo, Roy S., 4,157,107, Cl. 152-330.0RF.
Devlin, Robert E.; and Janneck, Frank W., 4,157,135, Cl. 192-53.00B.
Ferber, George, 4,157,427, Cl. 521-133.000.
Kulka, Frederick C., 4,157,052, Cl. 85-9.00R.
Liddle Sidney G., 4,157,011, Cl. 60-39.270.
Loper, Edward J., Jr.; and Lynch, David D., 4,157,041, Cl. 73-505.000.
O'Malley, John J., 4,157,046, Cl. 74-763.000.
Riddel, John W., 4,157,282, Cl. 204-1.00T.
General Signal Corporation: *See—*
Auer, John H., Jr.; and Rutherford, David B., Jr., 4,157,580, Cl. 361-167.000.
George H. Elliott Company: *See—*
Dobbs, James C., 4,157,335, Cl. 260-412.600.
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, to Dr. C. Otto & Comp. GmbH.; and Saarbergwerke A.C. Gas-cooling method and apparatus. 4,157,244, Cl. 48-62.00R.
Gertsch AG: *See—*
Hrachowitz, Frank; Ernst, Rossler; and Svoboda, Josef, 4,157,192, Cl. 280-618.000.
GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft: *See—*
Kralowetz, Bruno; Hojas, Hans; and Braunwieser, Johann, 4,157,026, Cl. 72-401.000.
Marzy, Otto, 4,157,055, Cl. 409-113.000.
Ghiringhelli, Giovanni; and Murari, Bruno, to SGS-ATES Componenti Elettronici S.p.A. Protective system for power stage of monolithic circuitry. 4,157,513, Cl. 330-298.000.
Giersch, Wolfgang K.: *See—*
Ohloff, Gunther; and Giersch, Wolfgang K., 4,157,451, Cl. 569-875.000.
Gilliatt, Charles L.: *See—*
Smith, William V.; Gilliatt, Charles L.; and Edgar, Richard H., 4,157,464, Cl. 219-10.55R.
Gillon, John: *See—*
Gates, Peter S.; Gillon, John; and Saggers, David T., 4,157,255, Cl. 71-76.000.
Gilman, Norman; and Fryer, Rodney I., to Hoffmann-La Roche Inc. Pyrazolo benzodiazepines. 4,157,331, Cl. 260-239.30T.
Giraldi, Piernicola: *See—*
Doria, Gianfederico; Giraldi, Piernicola; Lauria, Francesco; Corno, Maria L.; Sberze, Piero; and Tibolla, Marcello, 4,157,334, Cl. 260-345.200.
Giroud, Pierre: *See—*
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Givens, Edwin N.: *See—*
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., 4,157,293, Cl. 208-135.000.
Glasgow, Paul J. Retractable automatic self-adjusting clamping means. 4,157,140, Cl. 414-676.000.
Glaxo Laboratories Limited: *See—*
Ross, Gordon W.; Gardner nee Marshall, Monica J.; and Wolff, Walter, 4,157,278, Cl. 195-4.000.
Goffe, William L., to Xerox Corporation. Erasure in migration imaging system. 4,157,259, Cl. 96-1.0PS.
Goltsos, Costas E., to Teckton, Inc. Machines for conveying articles through a heat transfer medium. 4,157,018, Cl. 62-373.000.
Goodboy, Kenneth P.; and Koenig, James J., to Aluminum Company of America. Process for preparing low soda pseudoboehmite gel. 4,157,382, Cl. 423-628.000.
Goodyear Tire & Rubber Company, The: *See—*
Feeney, George W.; and Burroway, Gary L., 4,157,319, Cl. 260-27.0BB.
Ross, John A., 4,157,101, Cl. 138-130.000.
Gordon, Robert; and Boyan, Gerard E., to Perkin-Elmer Corporation, The. Wide angle scan camera. 4,157,218, Cl. 354-66.000.
Gotz, Mielsch: *See—*
Ladislav, Koydl; and Gotz, Mielsch, 4,157,290, Cl. 204-207.000.
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Grable, Jack W., to Emerson Electric Co. Thermostatic electrical switch and method of switch assembly. 4,157,525, Cl. 337-343.000.
Gracey, Viola N. Audio relaxer-massager. 4,157,088, Cl. 128-33.000.
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Gray, Kenneth E., to United States of America, Energy. Superconducting transistor. 4,157,555, Cl. 357-6.000.
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Grover, Bruce C.; Kanegsberg, Edward; Mark, John G.; and Meyer, Roger L., to Litton Systems, Inc. Nuclear magnetic resonance gyro. 4,157,495, Cl. 324-0.50F.
Grover, R. Kumar; and Erickson, Waldo C., to Fentron Industries, Inc. Air-water sealing system for metal windows and other improvements. 4,156,988, Cl. 49-390.000.
Grunwald, Grete. Method of machine reading documents. 4,157,532, Cl. 340-146.30G.
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Gullo, James M.; Heilman, William P.; Wayner, Robert J.; and Moser, Robert E., to Diamond Shamrock Corporation. Pharmacologically active substituted 1,2,4-triazines. 4,157,392, Cl. 424-249.000.
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Gyursanszky, Zoltan L., to Honeywell Inc. Dv/dt protection for solid state switches. 4,157,578, Cl. 361-91.000.

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Hall, Robert N., to United States of America, Energy. Coaxial nuclear radiation detector with deep junction and radial field gradient. 4,157,559, Cl. 357-30.000.

Haller, Friedrich, to Dixi S.A. Usine 2. Tool changing installation for automatic machine-tool. 4,156,962, Cl. 29-568.000.

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Coulter, Gerald R., 4,157,116, Cl. 166-280.000.

Hammer, Clarence F., to Du Pont de Nemours, E. I., and Company. Ethylene carbon monoxide copolymers containing epoxy side groups. 4,157,428, Cl. 521-134.000.

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Hanak, Joseph J., to RCA Corporation. Photodeposition of CRT screen structures using cermet IC filter. 4,157,215, Cl. 354-1.000.

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Harding, Douglas E. Visual aid and display device. 4,156,975, Cl. 35-1.000.

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Harwell, Herman R., to Malor Mfg. Inc. Device for detecting cable insulation faults. 4,157,541, Cl. 340-540.000.

Hasselas, Kjell, to Seasafe Transport AB. Tensioning device for chains, wire ropes etc. 4,157,171, Cl. 254-67.000.

Hassler, Dieter, to Siemens Aktiengesellschaft. Arrangement for determining the effective value and/or the power of electrical signals. 4,157,502, Cl. 324-123.00R.

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Hatogai, Naomi: *See*—
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Hernqvist, Karl G., to RCA Corporation. Method of reducing absorption losses in fused quartz and fused silica optical fibers. 4,157,253, Cl. 65-2.000.

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Janneck, Frank W.: *See*—
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Janssen, Harvey W., to Wolff Manufacturing Company. Tool bar assembly for track presses. 4,157,009, Cl. 59-11.000.

Janssen, Peter J. H.: *See*—
Apeldoorn, Hans J.; and Janssen, Peter J. H., 4,157,569, Cl. 358-160.000.

Janssen Pharmaceutica N.V.: *See*—
Sanczuk, Stefan; and Hermans, Hubert K. Fr., 4,157,393, Cl. 424-251.000.

Japan Crown Cork Co., Ltd.: *See*—
Doi, Kouichi, 4,157,143, Cl. 215-228.000.

Jean Walterscheid GmbH: *See*—
von Allworden, Wilhelm, 4,157,019, Cl. 64-4.000.

Jensen, Richard W.: *See*—
Peterson, Richard H.; and Jensen, Richard W., 4,157,051, Cl. 84-343.000.

Joanna Western Mills Company: *See*—
Donofrio, John D., 4,157,108, Cl. 160-263.000.

Johannsen, Roloff: *See*—
Sedlacek, Hans-Harald; Johannsen, Roloff; Seiler, Fritz; and Karges, Hermann, 4,157,383, Cl. 424-3.000.

John Zink Company: *See*—
Reed, Robert D., 4,157,239, Cl. 431-202.000.

Johnson, David F.: *See*—
Grice, Donald G.; Johnson, David F.; and Weinberger, Arnold, 4,157,590, Cl. 364-787.000.

Johnson, Eric A., III; Moore, Melvin E.; and Budd, Tom A., to Keystone Consolidated Industries, Inc. Package strapping device with floating heat tongue. 4,157,274, Cl. 156-499.000.

Johnson, Jarold W. Road debris deflector for boat trailers and other towing vehicles. 4,157,200, Cl. 296-1.00S.

Johnson, Leighton C., to Miles Laboratories, Inc. Flow-through type particle analyzing apparatus. 4,157,498, Cl. 324-71.0CP.

Johnson, Michael R.: *See*—
Bindra, Jasjit S.; Eggler, James F.; Johnson, Michael R.; and Schaaf, Thomas K., 4,157,341, Cl. 260-559.00B.

Johnson, Russell W.: *See*—
O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, 4,157,292, Cl. 208-111.000.

Jones, Julius D.: *See*—
Gannon, Patrick M.; Jones, Julius D.; Junod, Dale M.; Partridge, Richard L.; and Wright, Thomas R., 4,157,586, Cl. 364-200.000.

Jordan, Lawrence J., to Maytag Company, The. Silverware basket construction. 4,157,145, Cl. 220-19.000.

Jordan, Robert K. Carboxylate transmetallation-esterification process. 4,157,336, Cl. 260-429.00R.

Joy, Herman J., to Cluett, Peabody & Co., Inc. Method and apparatus for preshrinking cloth. 4,156,955, Cl. 26-18.600.

Joyce, Thomas F.; and Holtey, Thomas O., to Honeywell Information Systems Inc. High speed buffer memory system with word prefetch. 4,157,587, Cl. 364-200.000.

Junkermann, Helmut; and Hafner, Volker, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the purification of phenol and phenol formaldehyde containing waste water. 4,157,300, Cl. 210-40.000.

Junod, Dale M.: *See*—
Gannon, Patrick M.; Jones, Julius D.; Junod, Dale M.; Partridge, Richard L.; and Wright, Thomas R., 4,157,586, Cl. 364-200.000.

Kabushiki Kaisha Daini Seikosha: *See*—
Nakajima, Hiroyuki, 4,157,552, Cl. 346-141.000.

Kabushiki Kaisha Kawai Gakki Setsakusho: *See*—
Watanabe, Hironori, 4,157,049, Cl. 84-1.240.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Suganami, Takashi; Manzeki, Teruo; Takeda, Tashiro; Nakayama, Tetsuya; Shimizu, Koh; Kurihara, Keishiro; Fukumura, Tohru; and Hatogai, Naomi, 4,157,118, Cl. 172-4.500.

Kabushiki Kaisha Seikosha: *See*—
Ikeda, Yoshiaki, 4,156,960, Cl. 29-426.000.

Kacerek, John, to Becton, Dickinson and Company. Blood cell counter having dual testing heads. 4,157,499, Cl. 324-71.0CP.

Kahlow, Kurt J.; and Holbrook, Richard L., to Babcock & Wilcox Company, The. Forming die and process for tubular fittings. 4,157,024, Cl. 72-168.000.

Kai, Tetsunori: *See*—
Ikeda, Takeshi; Kawashima, Kozo; and Kai, Tetsunori, 4,157,206, Cl. 316-27.000.

Kaiser, Albrecht; and Heine, Rolf, to Herbert Kannegiesser Kommanditgesellschaft. Apparatus for precisely stacking textile pieces of sheetlike form. 4,157,176, Cl. 271-64.000.

Kaizerman, Samuel: *See*—
Chang, Eugene Y. C.; and Kaizerman, Samuel, 4,157,359, Cl. 260-849.000.

Kakinuma, Mikio, to Niles Parts Co., Ltd. Rotation detecting device. 4,157,482, Cl. 310-155.000.

Kaldun, Mark R.: *See*—
Miller, Curtis H.; and Kaldun, Mark R., 4,157,087, Cl. 128-741.000.

Kalfoglou, George, to Texaco Inc. Lignosulfonates as additives in recovery processes involving chemical recovery processes. 4,157,115, Cl. 166-274.000.

Kalfoglou, George; and Flournoy, Kenoth H., to Texaco Inc. Tertiary oil recovery process utilizing a preflush. 4,157,306, Cl. 252-8.55D.

Kall, Ronald J.; and Hoffman, Alan R., to North American Mfg. Co. Light detector particularly adapted for detecting the position of edges of moving strip. 4,157,477, Cl. 250-548.000.

Kaloi, Cyril M., to United States of America, Navy. Offset fed twin electric microstrip dipole antennas. 4,157,548, Cl. 343-700.0MS.

Kalyanova, Nadezhda F.: *See*—
Vulikh, Alexandr I.; Zagorskaya, Maina K.; Fokina, Natalia A.; Nikandrov, Gennady A.; Reznichenko, Lidia A.; Zverev, Mikhail P.; Barash, Arkady N.; Surkova, Valentina I.; Mavrin, Alexei M.; Troyan, Nikolai V.; Kalyanova, Nadezhda F.; Shimko, Ivan G.; Alovyainikov, Alexandr A.; and Pechalin, Lev I., 4,157,376, Cl. 423-240.000.

Kamphaus, Josef, to Geflugelschlachterei Gebr. Stolle, Firma. Machine for a continuous commercially packing of slaughtered fowl. 4,157,003, Cl. 53-572.000.

Kanaoka, Masazumi: *See*—
Odawara, Hiroyuki; Ohno, Masaji; Yamazaki, Toru; and Kanaoka, Masazumi, 4,157,267, Cl. 127-46.00A.

Kanegsberg, Edward: *See*—
Grover, Bruce C.; Kanegsberg, Edward; Mark, John G.; and Meyer, Roger L., 4,157,495, Cl. 324-0.50F.

Kanzelberger, Claude G.: *See*—
Huempfner, David F.; Mueller, Floyd F.; and Kanzelberger, Claude G., 4,157,070, Cl. 108-28.000.

Kao Soap Co., Ltd.: *See*—
Inamoto, Yoshiaki; and Aigami, Koji, 4,157,342, Cl. 260-561.00R.

Kapral, Christopher W.; and Heckman, Norman E., to GTE Laboratories Incorporated. Arithmetic logic apparatus. 4,157,589, Cl. 364-716.000.

Karges, Hermann: *See*—
Sedlacek, Hans-Harald; Johannsen, Roloff; Seiler, Fritz; and Karges, Hermann, 4,157,383, Cl. 424-3.000.

Karran, Frederick J.; and Nisbet, Arthur R. Ventilation and temperature control apparatus. 4,157,113, Cl. 165-42.000.

Kasai, Hiroshi: *See*—
Toyoda, Atsushi; and Kasai, Hiroshi, 4,157,109, Cl. 164-7.000.

Kashihara, Takao: *See*—
Endo, Seiji; Kashihara, Takao; Osako, Akitada; Shizuki, Tatsuhiko; and Ikegami, Tadashi, 4,157,436, Cl. 528-167.000.

Kashiwa, Norio: *See*—
Toyota, Akinori; Kashiwa, Norio; and Minami, Syuji, 4,157,435, Cl. 526-125.000.

Kashiwabara, Akira: *See*—
Kubotera, Kikuo; Kashiwabara, Akira; Sato, Kotaro; Ono, Hisatake; Sato, Hideo; and Mizobuchi, Yuzo, 4,157,262, Cl. 96-29.00R.

Kashiwaya, Mineo: *See*—
Inoue, Tadashi; Nakagawa, Tohru; and Kashiwaya, Mineo, 4,157,365, Cl. 261-34.00B.

Katsenes, Philip K. Gun recoil damper. 4,156,979, Cl. 42-1.00V.

Katsube, Akinaga. Fire escape. 4,157,127, Cl. 182-5.000.

Kavadias, Gerry: *See*—
Crenshaw, Ronnie R.; Kavadias, Gerry; and Saintonge, Roger F., 4,157,340, Cl. 260-551.00C.

Kawakami, James H.; Ward, Robert J.; and McCarthy, Neil J., to Union Carbide Corporation. Stabilized polymeric organosilane compositions. 4,157,321, Cl. 260-29.1SB.

Kawashima, Kozo: *See*—
Ikeda, Takeshi; Kawashima, Kozo; and Kai, Tetsunori, 4,157,206, Cl. 316-27.000.

Keely, William A., to Bendix Corporation, The. System for deriving fuel consumption of a vehicle. 4,157,030, Cl. 73-113.000.

Keiichi, Yoshizawa; and Kokichi, Yamakawa, to TDK Electronics Co., Ltd. Hand-operated bulk eraser for magnetic tape cassettes. 4,157,581, Cl. 361-267.000.

Keith, Carl D.: *See*—
Thompson, Charles E.; Mooney, John J.; Keith, Carl D.; and Mannion, William A., 4,157,316, Cl. 252-462.000.

Kemp, John, to Crane Packing Limited. Rotary mechanical face seals. 4,157,187, Cl. 277-87.000.

Kendall Company, The: *See*—
Patel, Bhupendra C., 4,157,094, Cl. 128-349.00B.
Peterson, James J.; and Cianci, James P., 4,157,043, Cl. 73-709.000.

Kennedy-Skipton, Henry K., to Imperial Chemical Industries Limited. Calcium sulphate hemihydrate plaster. 4,157,264, Cl. 106-111.000.

Kennedy, William H.; and Sashin, Donald, to University of Pittsburgh. Superimposition of television images. 4,157,572, Cl. 360-33.000.

Keystone Consolidated Industries, Inc.: *See*—
Johnson, Eric A., III; Moore, Melvin E.; and Budd, Tom A., 4,157,274, Cl. 156-499.000.

Kilmister, George T. F.; and Thomas, Douglas J., to Loewy Robertson Engineering Company Limited. Detection of the temperature of sheet or strip material. 4,157,039, Cl. 73-345.000.

Kim, Kyong-Min: *See*—
Berkman, Samuel; Kim, Kyong-Min; and Temple, Harold E., 4,157,373, Cl. 422-246.000.

Kimura, Katsuhiko; and Miyashita, Kiyoshi, to Olympus Optical Co., Ltd. Screen photosensitive body for electrographic apparatus. 4,157,260, Cl. 96-1.50R.

King, Christopher J. H., to Monsanto Company. Production of 1,2-bis(-hydroxyphenyl)ethane-1,2-diols by electrolytic reduction. 4,157,286, Cl. 204-73.00R.

King, Donald E., to Ayr King Corporation. Drive-through service window. 4,157,071, Cl. 109-19.000.

King, John M.: *See*—
Wilgus, Donovan R.; and King, John M., 4,157,308, Cl. 252-42.700.
Wilgus, Donovan R.; and King, John M., 4,157,309, Cl. 252-42.700.

Kinosz, Donald L.: *See*—
Carpenter, Lee G.; Cedro, Vito, III; and Kinosz, Donald L., 4,157,374, Cl. 423-210.000.

Kinser, Warren H., Sr. Marine life trap. 4,156,984, Cl. 43-105.000.

Kirvutza, John. Bicycle signal device. 4,157,075, Cl. 116-56.000.
Kissel, Ralph R.: *See—*
Currie, James R.; Kissel, Ralph R.; Deaton, Emsley T., Jr.; and Campbell, Richard A., 4,156,971, Cl. 33-174.00L.
Kissell, Fred N.; and Matta, Joseph E., to United States of America, Interior. Face ventilation system for coal mines. 4,157,204, Cl. 299-64.000.
Kitame, Fumio; Saitoh, Hiroshi; and Ishida, Nakao, to Green Cross Corporation, The. Cholesterol derivative-based medicaments acting on bio-protective mechanisms. 4,157,391, Cl. 424-238.000.
Kitamura, Kazuhiko; and Inada, Masami, to Aisin Seiki Kabushiki Kaisha. Temperature responsive valve assembly. 4,157,158, Cl. 236-48.00R.
Kitasato Institute, The: *See—*
Homma, Yuzuru; and Morihara, Kazuyuki, 4,157,389, Cl. 424-92.000.
Kivenson, Gilbert. Level sensor for stored fluids and particulate material. 4,157,036, Cl. 73-290.00R.
Kiwala, Jacob: *See—*
Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,157,351, Cl. 260-586.00R.
Klingman, Robert C., to Wilson Industries. Apparatus for retrieving a tubular member from a well. 4,157,199, Cl. 294-86.290.
Kneisel, Thomas F.; and Benenati, Robert L., to Motorola, Inc. Adjustable transmission line filter and method of constructing same. 4,157,517, Cl. 333-205.000.
Knop, Karl: *See—*
Gale, Michael T.; and Knop, Karl, 4,157,220, Cl. 355-19.000.
Knutsson, Bertil: *See—*
Bjork, Svante T., 4,157,139, Cl. 209-552.000.
Kobayashi, Masaaki: *See—*
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Koenig, James J.: *See—*
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Koeper, John I., to Crown Controls Corporation. Sequential control system for a lift truck. 4,157,467, Cl. 235-92.0CT.
Koerts, Kees: *See—*
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Kohnen, Anthony H.: *See—*
Burkhardt, Daniel F.; Evers, Carl A.; Kohnen, Anthony H.; Kohnen, Robert L.; Smith, Gary E.; and Wittman, Thomas J., 4,157,281, Cl. 202-176.000.
Kohnen, Robert L.: *See—*
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Kojima, Chiaki: *See—*
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Kokichi, Yamakawa: *See—*
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Kommanditgesellschaft Schwarzhaupt: *See—*
Lamprecht, Walther, 4,157,279, Cl. 195-103.50R.
Kong, Cheung T. Safety container opening means. 4,157,142, Cl. 215-223.000.
Konishiroku Photo Industry Co., Ltd.: *See—*
Ohta, Tatsuo; and Harada, Yoshiaki, 4,157,219, Cl. 355-10.000.
Konnai, Makoto: *See—*
Takematsu, Tetsuo; Konnai, Makoto; and Omokawa, Hiroyoshi, 4,157,257, Cl. 71-103.000.
Koontz, Paul G ; Cantu, Arthur M.; and Wright, Richard L., to Hipoint Research, Inc. X-ray film cassette. 4,157,474, Cl. 250-480.000.
Kornienko, Marat I.; Furman, Anatoly V.; Podboronov, Boris P.; and Shevchuk, Vyacheslav V. Controlled multidigit resistance box. 4,157,494, Cl. 323-79.000.
Koski, William E.: *See—*
Wagenknecht, Austin C., deceased; Daravingas, George V.; and Koski, William E., 4,157,385, Cl. 424-48.000.
Kotaka, Mitsuo; Takahara, Hisao; Muraki, Kaisuke; Takahashi, Ryo; and Matsuura, Tamizo, to Yokogawa Electric Works, Ltd. Infrared gas analyzer. 4,157,470, Cl. 250-345.000.
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Benedek, Gyorgy; Bese, Andras; Domokos, Jozsef; and Kovacs, Istvan, 4,157,162, Cl. 239-707.000.
Kraftwerk Union Aktiengesellschaft: *See—*
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Kralowetz, Bruno; Hojas, Hans; and Braunwieser, Johann, to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft. Swaging machine for swaging large tubes. 4,157,026, Cl. 72-401.000.
Kramer, Leo, to Ingersoll-Rand Company. Lubricator. 4,157,132, Cl. 184-7.00D.
Krieble, Robert W.: *See—*
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Kristiansen, Haakon H. Internal combustion engine and operating cycle. 4,157,079, Cl. 123-43.0AA.
Kubota, Ltd.: *See—*
Kyomen, Junsuke, 4,157,372, Cl. 264-296.000.
Tanaka, Yoshio; Togawa, Susumu; and Sakoda, Akinori, 4,157,111, Cl. 164-76.000.
Kubotera, Kikuo; Kashiwabara, Akira; Sato, Kotaro; Ono, Hisatake; Sato, Hideo; and Mizobuchi, Yuzo, to Fuji Photo Film Co., Ltd. Intensification of photographic silver images by physical development and improvement in physical developer solution for use therein. 4,157,262, Cl. 96-29.00R.
Kuhnelt, Gert: *See—*
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Kuijpers, Franciscus A.: *See—*
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Kulka, Frederick C., to General Motors Corporation. Self-leveling stud. 4,157,052, Cl. 85-9.00R.
Kumm, William H., to Westinghouse Electric Corp. Under-ice traveling shelter system. 4,157,229, Cl. 405-185.000.
Kunihiro, Takatoshi: *See—*
Iwao, Yozo; Yamamoto, Susumu; and Kunihiro, Takatoshi, 4,157,294, Cl. 208-264.000.
Kuniyoshi, Yasunobu; Okada, Takashi; and Sumi, Takao, to Sony Corporation. Apparatus for eliminating time base errors from an information signal. 4,157,565, Cl. 358-8.000.
Kupperman, Dennis: *See—*
Kupperman, Sam; and Kupperman, Dennis, 4,156,986, Cl. 46-201.000.
Kupperman, Sam; and Kupperman, Dennis, to RB Toy Development Co. One-piece molded plastic vehicle and transport member. 4,156,986, Cl. 46-201.000.
Kurihara, Keishiro: *See—*
Suganami, Takashi; Manzeki, Teruo; Takeda, Tashiro; Nakayama, Tetsuya; Shimizu, Koh; Kurihara, Keishiro; Fukumura, Tohru; and Hatogai, Naomi, 4,157,118, Cl. 172-4.500.
Kuroda, Minoru, to Nishizawa Shoji, Ltd.; and Dimension Weld International Corporation, The. Method of making an applique article. 4,157,272, Cl. 156-219.000.
Kurtz, Ronald C.: *See—*
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Kyomen, Junsuke, to Kubota, Ltd. Method of molding a connecting socket part on a synthetic resinous pipe end. 4,157,372, Cl. 264-296.000.
Ladislav, Koydl; and Gotz, Mielsch, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Coating arrangement. 4,157,290, Cl. 204-207.000.
La Fleur, George H. Container. 4,157,103, Cl. 141-98.000.
Lagabe, Andre E. R.; and Prevotat, Bernard A., to Pont-a-Mousson S.A. Device for modifying the thickness of a body extruded at a constant rate. 4,157,235, Cl. 425-71.000.
Lahr, Robert G., to Ideal Toy Corporation. Toy vehicle. 4,156,987, Cl. 46-253.000.
Lamarche, Andre G., to Stopcircuit Societe Anonyme. Miniature circuit breaker. 4,157,524, Cl. 337-68.000.
Lamprecht, Walther, to Kommanditgesellschaft Schwarzhaupt. Process for the determination of at least one of the isoenzymes of lactatedehydrogenase. 4,157,279, Cl. 195-103.50R.
Landowne, Robert A., to United States of America, Army. Two-phase filter and thin layer chromatography process. 4,157,299, Cl. 210-31.00C.
Larcher, Earl L.: *See—*
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La Rochelle, Paul J. Soft, chewable lozenge forming a sticky coating on teeth when combined with saliva in the mouth which is removable only by brushing. 4,157,386, Cl. 424-52.000.
Lashley, Ronald T., to Emmons Guitar Company, Inc. Pedal guitar. 4,157,050, Cl. 84-312.00P.
Laupman, Robert R., to Novanex Automation N.V. Electronic reverberation device. 4,157,511, Cl. 330-107.000.
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Lebedeva, Valentina I.: *See—*
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Leca, Jean-Paul; and Nardi, Alain, to Societe Chimique des Charbonnages — CdF Chimie. Rheometer. 4,157,029, Cl. 73-55.000.
Ledex, Inc.: *See—*
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Leer, Inc.: *See—*
Collins, John M.; and Mountain, Charles T., 4,157,201, Cl. 296-156.000.

Le Fevre, Clyde E.: *See—*
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Leland, Gerald H., to Ledex, Inc. Rotary solenoid. 4,157,521, Cl. 335-272.000.
Lemforder Metallwaren AG: *See—*
Hahle, Hermann, 4,157,227, Cl. 403-228.000.
Lemmer, Alfred. Cutting apparatus for trimming component leads projecting from the underside of a printed wiring board. 4,157,048, Cl. 83-579.000.
Levine, Alfred B. Falling target light game and target practice device. 4,157,182, Cl. 273-101.100.
Levine, Fred. Slotted shaft adapter. 4,157,225, Cl. 403-3.000.
Levitt, Albert P.; and Band, Hans E., to United States of America, Army. Method of making metal impregnated graphite fibers. 4,157,409, Cl. 427-299.000.
Libbey-Owens-Ford Company: *See—*
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Liddle Sidney G., to General Motors Corporation. Gas turbine flywheel hybrid propulsion system. 4,157,011, Cl. 60-39.270.
Lienhard, Robert W., to Swiss Fabricating, Inc. Scaffolding for working on contoured surfaces. 4,156,996, Cl. 52-126.000.
Life Savers, Inc.: *See—*
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Liller, Delbert I. Method and apparatus for testing and separating minerals. 4,157,295, Cl. 209-5.000.
Lind, Charles J.: *See—*
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Lindahl, John R. Water heater. 4,157,077, Cl. 122-159.000.
Lindenberg, Hugo. Laminated panel construction and method of making same. 4,157,415, Cl. 428-284.000.
Lines, Ellwood L.; Fairbrother, Robert J.; and Herbst, John A., to Olin Corporation. Catalytic epoxidation of alkylene compounds. 4,157,346, Cl. 260-348.310.
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Lingl, Hans, to Lingl Corporation. Production of split tile. 4,157,408, Cl. 427-209.000.
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Litchfield, Everett S. Manual grading tool. 4,157,119, Cl. 172-375.000.
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Llauro nee Darricades, Marie-France: *See—*
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Loewy Robertson Engineering Company Limited: *See—*
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Lofquist, Alden A., Jr. Gasoline dispensing and vapor recovery apparatus. 4,157,104, Cl. 141-292.000.
Loper, Edward J., Jr.; and Lynch, David D., to General Motors Corporation. Sonic vibrating bell gyro. 4,157,041, Cl. 73-505.000.
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Fleckenstein, Albrecht; Janke, Johanna; Lossnitzer, Klaus; and Voelger, Karl-Dieter, 4,157,394, Cl. 424-251.000.
Lotte Co., Ltd.: *See—*
Ogawa, Koichi; Tezuka, Shichigoro; Terasawa, Masatoshi; and Iwata, Shizuo, 4,157,402, Cl. 426-5.000.
Loughrey, Janice Margaret: *See—*
Loughrey, Kevin A., 4,157,089, Cl. 128-74.000.
Loughrey, Kevin A., to Loughrey, Janice Margaret. Physiotherapy table. 4,157,089, Cl. 128-74.000.
Love, Donald L.: *See—*
Collins, Robert H., III; and Love, Donald L., 4,157,247, Cl. 55-31.000.
Lowndes Engineering Co., Inc.: *See—*
Waldron, David W., 4,157,160, Cl. 239-8.000.
Luff, Brian A.: *See—*
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Luke, George M.: *See—*
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Lundberg, Robert D.; Makowski, Henry S.; Bock, Jan; and Zawadski, Thomas, to Exxon Research & Engineering Co. Bulk sulfonation process. 4,157,432, Cl. 526-31.000.
Lusk, Norman E., to Canada, Her Majesty the Queen in right of. Revolver-type repeating gun. 4,156,981, Cl. 42-63.000.
Lynch, David D.: *See—*
Loper, Edward J., Jr.; and Lynch, David D., 4,157,041, Cl. 73-505.000.
Lynch, Patrick E., Jr., to Chemko Industries, Inc. Carpet soil extractor having a powered brush. 4,156,952, Cl. 15-320.000.
Lynes, Inc.: *See—*
Balkanli, Hayati, 4,157,535, Cl. 340-18.0CM.
Machner, Peter: *See—*
Plockinger, Erwin; Kuhnelt, Gert; and Machner, Peter, 4,157,110, Cl. 164-52.000.
MacKay, Donald A. M.: *See—*
Stroz, John J.; Bakal, Abraham I.; Witzel, Frank; and MacKay, Donald A. M., 4,157,401, Cl. 426-3.000.
Maeda, Yoji: *See—*
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Magosch, Karl-Heinz: *See—*
Rueter, Joern; Burzin, Klaus; Magosch, Karl-Heinz; and Feinauer, Roland, 4,157,330, Cl. 260-340.200.
Maiorano, Michele; Valentini, Luigi; and Praga, Claudio, to Farmitalia Carlo Erba S.p.A. Apparatus for providing skin cuts to a predetermined measure. 4,157,086, Cl. 128-637.000.
Makowski, Henry S.: *See—*
Lundberg, Robert D.; Makowski, Henry S.; Bock, Jan; and Zawadski, Thomas, 4,157,432, Cl. 526-31.000.
Malor Mfg. Inc.: *See—*
Harwell, Herman R., 4,157,541, Cl. 340-540.000.
Mandel, Alan F.: *See—*
Corcoran, Harold L.; Eichler, Kenneth M.; and Mandel, Alan F., 4,157,133, Cl. 187-29.00R.
Mannion, William A.: *See—*
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Suganami, Takashi; Manzeki, Teruo; Takeda, Tashiro; Nakayama, Tetsuya; Shimizu, Koh; Kurihara, Keishiro; Fukumura, Tohru; and Hatogai, Naomi, 4,157,118, Cl. 172-4.500.
MAR-PHA, Societe d'Etude et d'Exploitation de Marques: *See—*
Mardiguian, Jean, 4,157,400, Cl. 424-330.000.
Mardiguian, Jean, to MAR-PHA, Societe d'Etude et d'Exploitation de Marques. Terpenophenoxyalkylamines and pharmaceutical compositions and uses thereof. 4,157,400, Cl. 424-330.000.
Margus, Albert F., Jr., to Continental Seafoods, Inc. Process and apparatus for cooking. 4,157,061, Cl. 99-352.000.
Mark Controls Corporation: *See—*
Modes, Edward E., 4,157,159, Cl. 236-87.000.
Mark, John G.: *See—*
Grover, Bruce C.; Kanegsberg, Edward; Mark, John G.; and Meyer, Roger L., 4,157,495, Cl. 324-0.50F.
Marmonier, Pierre; Moreau, Jean; and Nervi, Jean-Claude, to Commissariat a l'Energie Atomique. Device for measuring neutron flux in a nuclear reactor. 4,157,277, Cl. 176-19.00J.
Marquette Metal Products Co.: *See—*
Anderson, J. Edward C., 4,157,120, Cl. 173-93.000.
Martech International, Inc.: *See—*
Tisdale, Benjamin C.; and Nicholson, William B., 4,157,023, Cl. 72-161.000.
Martignoni, Pasquale; Chew, William M.; Ayers, Orval E.; and Murfree, James A., Jr., to United States of America, Army. Hydrogen gas generator from hydrazine/ammonia. 4,157,270, Cl. 149-109.600.
Martin, Ronald G.; Powers, Joseph; and Trocciola, John C., to United Technologies Corporation. Thermally conductive caulk. 4,157,327, Cl. 260-42.270.
Maruzeni, Shouji: *See—*
Yasuda, Nozomi; Terada, Kimio; Itagaki, Kazuo; Toyoshima, Yasuo; Maruzeni, Shouji; Itoh, Tadasu; Yokobori, Hideo; and Satoh, Susumu, 4,157,405, Cl. 426-607.000.
Marvin Glass & Associates: *See—*
Meyer, Burton C.; and Hicks, Alan A., 4,157,183, Cl. 273-243.000.
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Reiner, Alberto; and Rossi, Giacinto, 4,157,440, Cl. 536-27.000.
Marzy, Otto, to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft. Copying attachment for crankshaft milling machine. 4,157,055, Cl. 409-113.000.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Ladislav, Koydl; and Gotz, Mielsch, 4,157,290, Cl. 204-207.000.
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Matsuda, Hiroshi: *See—*
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Matsumoto, Makoto: *See—*
Hatanaka, Masayuki; Matsumoto, Makoto; and Yonezawa, Masaharu, 4,157,426, Cl. 521-122.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
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Nagasawa, Masahiro; Ishida, Tomio; and Yoshikawa, Yoshitaka, 4,157,317, Cl. 252-511.000.
Nakabe, Ryuhei; and Tanaka, Hiromichi, 4,157,566, Cl. 358-44.000.
Matsuura, Tamizo: *See—*
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Mavrin, Alexei M.: *See—*
Vulikh, Alexandr I.; Zagorskaya, Maina K.; Fokina, Natalia A.; Nikandrov, Gennady A.; Reznichenko, Lidia A.; Zverev, Mikhail P.; Barash, Arkady N.; Surkova, Valentina I.; Mavrin, Alexei M.; Troyan, Nikolai V.; Kalyanova, Nadezhda F.; Shimko, Ivan G.; Alovyainikov, Alexandr A.; and Pechalin, Lev I., 4,157,376, Cl. 423-240.000.
Max Datwyler & Co., Firma: *See—*
Datwyler, Max, 4,157,067, Cl. 101-415.100.
May, Denis R. W., to J. E. Hanger & Company Limited. Prosthetic wrist fitting. 4,156,945, Cl. 3-12.400.

Mayer, Richard J. Automatically resettable toy phonograph assembly. 4,157,185, Cl. 274-1.00A.

Maytag Company, The: *See*—
Jordan, Lawrence J., 4,157,145, Cl. 220-19.000.

McCarthy, John W., to Belden Corporation. Leaky coaxial cable having shield layer with uniform gap. 4,157,518, Cl. 333-237.000.

McCarthy, Neil J.: *See*—
Kawakami, James H.; Ward, Robert J.; and McCarthy, Neil J., 4,157,321, Cl. 260-29.1SB.

McClintock, Jack M., to Morgan Adhesives Company. Composite pressure sensitive adhesive construction. 4,157,410, Cl. 428-40.000.

McClure, James B. Equipment shelter. 4,156,998, Cl. 52-309.500.

McClurg, William E., to ACF Industries, Incorporated. Groove mounted resilient valve seat having deformable lip. 4,157,170, Cl. 251-315.000.

McDaniels, William C. Weed removing tool. 4,157,198, Cl. 294-50.900.

McIlrath, William P., to Racine Railroad Products, Inc. Rail cutting apparatus. 4,156,991, Cl. 51-178.000.

McKay, Alexander D. D., to Synthetic Fabrics (Scotland) Limited. Process for producing matt surfaced highly, fibrillated woven synthetic fabric. 4,156,957, Cl. 28-159.000.

McMillan, Stephen L., to General Electric Company. Pulley drive system. 4,157,042, Cl. 74-230.17E.

Med General, Inc.: *See*—
Miller, Curtis H.; and Kaldun, Mark R., 4,157,087, Cl. 128-741.000.

Medtronic, Inc.: *See*—
Phillips, Gary M., 4,157,433, Cl. 526-43.000.

Mellon, A. Darline: *See*—
Okuzumi, Yuzi; Mellon, A. Darline; and Wasserman, David, 4,157,437, Cl. 528-354.000.

Mercer, Gerald D.: *See*—
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Merck & Co., Inc.,: *See*—
Colegrove, George T., 4,157,322, Cl. 260-15.000.

Merz, Ernest J. Automatic tire pressure monitoring system. 4,157,530, Cl. 340-58.000.

Mesman, James W., to Olinkraft, Inc. Traffic channeling device. 4,157,210, Cl. 350-97.000.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Deter, Burkhard, 4,157,522, Cl. 337-4.000.

Meyer, Burton C.; and Hicks, Alan A., to Marvin Glass & Associates. Game apparatus. 4,157,183, Cl. 273-243.000.

Meyer Products, Inc.: *See*—
Hetrick, Vernon L., 4,157,150, Cl. 222-626.000.

Meyer, Roger L.: *See*—
Grover, Bruce C.; Kanegsberg, Edward; Mark, John G.; and Meyer, Roger L., 4,157,495, Cl. 324-0.50F.

Michels, Harold T.; and Jackson, Raymond P., to International Nickel Company, Inc., The. Method of preparing a supported catalyst and the catalyst prepared by the method. 4,157,315, Cl. 252-458.000.

Miesch, Hans, to Escher Wyss Limited. Releasable fastening. 4,156,958, Cl. 29-116.0AD.

Mikun, Norbert K. Game playing apparatus. 4,156,976, Cl. 35-8.00R.

Miles Laboratories, Inc.: *See*—
Johnson, Leighton C., 4,157,498, Cl. 324-71.0CP.
Miller, Curtis H.; and Kaldun, Mark R., to Med General, Inc. Peripheral nerve stimulator. 4,157,087, Cl. 128-741.000.

Miller, Gerald W.: *See*—
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Miller, Harold N.: *See*—
Ryer, Jack; Miller, Harold N.; Zielinski, James; and Brois, Stanley J., 4,157,243, Cl. 44-63.000.

Miller, John A., Jr., to AMF Incorporated. Apparatus for cleaning threaded pipe ends. 4,157,096, Cl. 134-111.000.

Minami, Syuji: *See*—
Toyota, Akinori; Kashiwa, Norio; and Minami, Syuji, 4,157,435, Cl. 526-125.000.

Mine, Katsutoshi; and Yokoyama, Masuo, to Toray Silicone Company, Ltd. Curable two-part silicone rubber compositions with improved adhesion properties. 4,157,357, Cl. 260-825.000.

Minke, Gerhardus, to Ter Borg & Mensinga's Machinefabriek N.V. Method of and apparatus for arranging twine around a bale. 4,157,063, Cl. 100-3.000.

Minnesota Mining and Manufacturing Company: *See*—
Deneau, Kenneth S., 4,157,412, Cl. 428-147.000.
Heilmann, Steven M., 4,157,418, Cl. 428-355.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ishihara, Sadao, 4,157,222, Cl. 355-75.000.

Miranol Chemical Company, Inc., The: *See*—
Christiansen, Arvid, 4,157,388, Cl. 424-70.000.

Mirhej, Michael E., to Du Pont de Nemours, E. I., and Company. Polyester feed yarn for draw-texturing. 4,157,419, Cl. 428-373.000.

Mirman, Alfred H.: *See*—
Schiffmann, Robert F.; Mirman, Alfred H.; Grillo, Richard J.; and Wouda, Sally A., 4,157,403, Cl. 426-234.000.

Mischenko, Alexandr P.: *See*—
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Misiano, Carlo: *See*—
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Mitarai, Keiji: *See*—
Arika, Junji; Takitani, Masaru; Mitarai, Keiji; and Yamamoto, Kazuaki, 4,157,379, Cl. 423-430.000.

Mitchell, David S.; and Sageman, David R., to Chevron Research Company. Countercurrent plug-like flow of two solids. 4,157,245, Cl. 48-197.00R.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Naito, Yushi; Moritani, Yoichi; and Uchida, Yoshinori, 4,157,514, Cl. 331-4.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Toyota, Akinori; Kashiwa, Norio; and Minami, Syuji, 4,157,435, Cl. 526-125.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Nakatani, Kiyoshi; Inoue, Tsuneo; Nishizawa, Tutomu; Numata, Satoshi; and Ishii, Tsutomu, 4,157,333, Cl. 260-340.50R.
Ono, Hiroshi; and Inoue, Shigeru, 4,157,348, Cl. 260-564.00D.

Miya, Masami, to Seizo Takahashi. Spectacle washer. 4,157,097, Cl. 134-117.000.

Miyashita, Kiyoshi: *See*—
Kimura, Katsuhiko; and Miyashita, Kiyoshi, 4,157,260, Cl. 96-1.50R.

Mizobuchi, Yuzo: *See*—
Kubotera, Kikuo; Kashiwabara, Akira; Sato, Kotaro; Ono, Hisatake; Sato, Hideo; and Mizobuchi, Yuzo, 4,157,262, Cl. 96-29.00R.

Miekodaj, Ronald L., to United States of America, Energy. High temperature ion source for an on-line isotope separator. 4,157,471, Cl. 250-423.00R.

MM Systems Corporation: *See*—
Sorrells, Paul J., Jr., 4,156,993, Cl. 52-60.000.

Moates, Roger D.; Tomasic, Nicholas A.; and Leah, Charles W., to Westinghouse Electric Corp. Magnetic flux shifting ground fault trip indicator. 4,157,520, Cl. 335-230.000.

Mobil Oil Corporation: *See*—
Haag, Werner O.; and Huang, Tracy J., 4,157,338, Cl. 260-449.00R.
Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., 4,157,293, Cl. 208-135.000.

Modes, Edward E., to Mark Controls Corporation. Automatic fluid flow regulator. 4,157,159, Cl. 236-87.000.

Moen, Lenard E. Multiple nozzle fluid dispenser for complex fluid delivery patterns. 4,157,149, Cl. 222-486.000.

Moffett, George A., III. Portable universal apparatus for use in pressure testing engine cylinder heads and blocks. 4,157,028, Cl. 73-49.700.

Molday, Robert S.: *See*—
Yen, Shiao-Ping S.; Rembaum, Alan; and Molday, Robert S., 4,157,323, Cl. 260-29.70M.

Molvar, Allen E., to Clevepak Corporation. Aeration method and system. 4,157,304, Cl. 210-220.000.

Mondoloni, Pierre: *See*—
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Monsanto Company: *See*—
Baer, Massimo, 4,157,326, Cl. 260-42.180.
Culbertson, Harry M., 4,157,324, Cl. 260-32.80R.
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King, Christopher J. H., 4,157,286, Cl. 204-73.00R.

Mont, Howard I. Automobile emergency signal. 4,157,531, Cl. 340-107.000.

Monticelli, Dennis M., to National Semiconductor Corporation. Delta V_{BE} generator circuit. 4,157,493, Cl. 323-9.000.

Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. 1-(2,6,6-Trimethyl-1,3-cyclohexadien-1-yl)-1,3-butanedione and organoleptic uses thereof. 4,157,351, Cl. 260-586.00R.

Mookherjee, Braja D.: *See*—
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Moon, Ronald L.: *See*—
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Mooney, John J.: *See*—
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Moore, Dan B. Drywall joint filler. 4,157,271, Cl. 156-71.000.

Moore, Harry O., to William C. Cribbs, a part interest. Fishing line tensioning device. 4,156,983, Cl. 43-25.000.

Moore, Melvin E.: *See*—
Johnson, Eric A., III; Moore, Melvin E.; and Budd, Tom A., 4,157,274, Cl. 156-499.000.

Moreau, Jean: *See*—
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Morgan Adhesives Company: *See*—
McClintock, Jack M., 4,157,410, Cl. 428-40.000.

Morihara, Kazuyuki: *See*—
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Morishita, Nobuo; and Saito, Mitsutaka, to Toyo Soda Manufacturing Co., Ltd. Process for carboxylation of ethylene-vinyl acetate copolymers. 4,157,362, Cl. 260-878.00R.

Moritani, Yoichi: *See*—
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Morley Furniture Spring Corporation: *See*—
Crosby, Lawton H., 4,157,172, Cl. 267-110.000.

Crosby, Lawton H., 4,157,173, Cl. 267-110.000.
Morris, William A. Rotary earth boring drill and method of assembly thereof. 4,157,122, Cl. 175-369.000.
Moser, Robert E.: *See*—
Gullo, James M.; Heilman, William P.; Wayner, Robert J.; and Moser, Robert E., 4,157,392, Cl. 424-249.000.
Motorola, Inc.: *See*—
Kneisel, Thomas F.; and Benenati, Robert L., 4,157,517, Cl. 333-205.000.
Mountain, Charles T.: *See*—
Collins, John M.; and Mountain, Charles T., 4,157,201, Cl. 296-156.000.
Mueller, Floyd F.: *See*—
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Muller, Gerhard: *See*—
Bodenbenner, Kurt; Muller, Gerhard; and Muller, Heinrich, 4,157,381, Cl. 423-525.000.
Muller, Hans, to Chemap AG. Method of filtering molten coal. 4,157,305, Cl. 210-42.00S.
Muller, Heinrich: *See*—
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Munakata, Keiichi: *See*—
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Murakami, Mutsuaki; and Yoshimura, Susumu, to Matsushita Electric Industrial Co., Ltd. Heat-sensitive thiazolium-7,7,8,8-tetracyanoquinodimethane semiconductive materials. 4,157,332, Cl. 260-302.00R.
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Murfree, James A., Jr.: *See*—
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Murphy, Charles H., to ITD Industries Inc. Solar control products. 4,157,417, Cl. 428-344.000.
Murray, Donnie L.: *See*—
Murray, Edwin G.; and Murray, Donnie L., 4,157,186, Cl. 277-31.000.
Murray, Edwin G.; and Murray, Donnie L. Heavy duty rotating blowout preventor. 4,157,186, Cl. 277-31.000.
Murty, Hari N., to Carborundum Company, The. Granular activated carbon manufacture from sub-bituminous coal treated with dilute inorganic acid: direct activation method. 4,157,314, Cl. 252-444.000.
Myers, Felix E., to Gould Inc. Plug-in contact structure for panelboard. 4,157,582, Cl. 361-353.000.
Nadler, Martin S. Method of manufacturing shoes. 4,156,947, Cl. 12-142.00R.
Nagasawa, Masahiro; Ishida, Tomio; and Yoshikawa, Yoshitaka, to Matsushita Electric Industrial Co., Ltd. Resin-bonded graphite body for a dry battery and method of making the same. 4,157,317, Cl. 252-511.000.
Nagy, Lou: *See*—
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Naito, Yushi; Moritani, Yoichi; and Uchida, Yoshinori, to Mitsubishi Denki Kabushiki Kaisha. Synchronizing signal generator. 4,157,514, Cl. 331-4.000.
Nakabe, Ryuhei; and Tanaka, Hiromichi, to Matsushita Electric Industrial Co., Ltd. Single tube color television camera with color correction. 4,157,566, Cl. 358-44.000.
Nakagawa, Tohru: *See*—
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Nakajima, Hiroyuki, to Kabushiki Kaisha Daini Seikosha. Pen holding device for an automatic drafting device. 4,157,552, Cl. 346-141.000.
Nakatani, Kiyoshi; Inoue, Tsuneo; Nishizawa, Tutomu; Numata, Satoshi; and Ishii, Tsutomu, to Mitsui Toatsu Chemicals, Inc. Process for preparing piperonal. 4,157,333, Cl. 260-340.50R.
Nakayama, Tetsuya: *See*—
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Namy, Gerald, to Creusot-Loire Enterprises. Suction device for the wet extraction of dust. 4,157,249, Cl. 55-230.000.
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National Research Development Corporation: *See*—
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Monticelli, Dennis M., 4,157,493, Cl. 323-9.000.
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Nawata, Yoshiaki; Kobayashi, Masaaki; Yajima, Kazuo; Iwasawa, Shigeo; and Takahashi, Koji, to Fujitsu Limited. High power transistor. 4,157,561, Cl. 357-36.000.
Nervi, Jean-Claude: *See*—
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Nichols, Roy L., to United States of America, Navy. Hybrid terminal assist landing. 4,157,544, Cl. 343-5.0GC.
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Nicoli, Jacques A. G., to Societe d'Exploitation de Produits et de Techniques pour l'Aeronautique & l'Automatique. Multiperiodical phasemeter. 4,157,500, Cl. 324-83.00R.
Nihon Beru-Haueru Kabushiki Kaisha: *See*—
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Nihon Nohyaku Co. Ltd.: *See*—
Hiraga, Kunikazu; Shibayama, Shoichi; Yanai, Isao; and Harada, Tatsuo, 4,157,256, Cl. 71-95.000.
Nikandrov, Gennady A.: *See*—
Vulikh, Alexandr I.; Zagorskaya, Maina K.; Fokina, Natalia A.; Nikandrov, Gennady A.; Reznichenko, Lidia A.; Zverev, Mikhail P.; Barash, Arkady N.; Surkova, Valentina I.; Mavrin, Alexei M.; Troyan, Nikolai V.; Kalyanova, Nadezhda F.; Shimko, Ivan G.; Alovyainikov, Alexandr A.; and Pechalin, Lev I., 4,157,376, Cl. 423-240.000.
Niles Parts Co., Ltd.: *See*—
Kakinuma, Mikio, 4,157,482, Cl. 310-155.000.
Yamamoto, Harushige, 4,157,038, Cl. 73-313.000.
Ning, Tak Hung; and Yu, Hwa Nien, to International Business Machines Corporation. Utilizing polysilicon diffusion sources and special masking techniques. 4,157,269, Cl. 148-1.500.
Nippon Electric Co., Ltd.: *See*—
Sakoe, Hiroaki; and Chiba, Seibi, 4,157,457, Cl. 179-1.0SA.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Toyoda, Atsushi; and Kasai, Hiroshi, 4,157,109, Cl. 164-7.000.
Nippon Kogaku K.K.: *See*—
Tsuchiya, Yukikazu, 4,157,021, Cl. 64-30.00C.
Nippon Telegraph and Telephone Public Corporation: *See*—
Takano, Rikuo; Ohota, Yutaka; Yamamoto, Yoichi; Sumitomo, Yuji; Kobayashi, Toshio; and Aiba, Masahiko, 4,157,551, Cl. 346-75.000.
Nisbet, Arthur R.: *See*—
Karran, Frederick J.; and Nisbet, Arthur R., 4,157,113, Cl. 165-42.000.
Nishizawa Shoji, Ltd.: *See*—
Kuroda, Minoru, 4,157,272, Cl. 156-219.000.
Nishizawa, Tutomu: *See*—
Nakatani, Kiyoshi; Inoue, Tsuneo; Nishizawa, Tutomu; Numata, Satoshi; and Ishii, Tsutomu, 4,157,333, Cl. 260-340.50R.
Nissan Diesel Motor Co., Ltd.: *See*—
Wake, Junichi; and Matsuda, Hiroshi, 4,157,081, Cl. 123-119.00A.
Nitro Nobel AB: *See*—
Gustafsson, Ake; and Westberg, Jan, 4,157,069, Cl. 102-200.000.
Nogami, Tomoyuki; and Ohta, Takaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Inertia-controlled valve unit for vehicle braking systems. 4,157,205, Cl. 303-24.00A.
Norman, Arthur E., to Torr Vacuum Products. Fluid operated gate valve for use with vacuum equipment. 4,157,169, Cl. 251-195.000.
North American Mfg. Co.: *See*—
Kall, Ronald J.; and Hoffman, Alan R., 4,157,477, Cl. 250-548.000.
Novanex Automation N.V.: *See*—
Laupman, Robert R., 4,157,511, Cl. 330-107.000.
Numata, Satoshi: *See*—
Nakatani, Kiyoshi; Inoue, Tsuneo; Nishizawa, Tutomu; Numata, Satoshi; and Ishii, Tsutomu, 4,157,333, Cl. 260-340.50R.
Nyman, Oscar W., to Hammerblow Corporation, The. Coupler with operable handle. 4,157,190, Cl. 280-512.000.
O'Connor, Richard A., to General Electric Company. Dental X-ray tube head. 4,157,476, Cl. 250-520.000.
Odawara, Hiroyuki; Ohno, Masaji; Yamazaki, Toru; and Kanaoka, Masazumi, to Toray Industries, Inc. Continuous separation of fructose from a mixture of sugars. 4,157,267, Cl. 127-46.00A.
O'Farrell, Francis J., to International Telephone & Telegraph Corporation. Correlation radar system. 4,157,545, Cl. 343-17.10R.
Ogawa, Koichi; Tezuka, Shichigoro; Terasawa, Masatoshi; and Iwata, Shizuo, to Lotte Co., Ltd. Center-filled chewing gum. 4,157,402, Cl. 426-5.000.
Ogawa, Ryota, to Asahi Kogaku Kogyo Kabushiki Kaisha. Large aperture miniature wide-angle zoom lens system. 4,157,212, Cl. 350-184.000.
O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, to UOP Inc. Hydrocracking process to maximize middle distillate. 4,157,292, Cl. 208-111.000.
Ohki, Hiroshi; Otobe, Takashi; and Kojima, Chiaki, to Sony Corporation. Method and apparatus for optically reproducing a rotatable record with a scanning light beam of changing size. 4,157,568, Cl. 358-128.000.
Ohloff, Gunther; and Giersch, Wolfgang K., to Firmenich, S.A. Process for the preparation of ipsdienol. 4,157,451, Cl. 569-875.000.
Ohno, Masaji: *See*—
Odawara, Hiroyuki; Ohno, Masaji; Yamazaki, Toru; and Kanaoka, Masazumi, 4,157,267, Cl. 127-46.00A.
Ohota, Yutaka: *See*—
Takano, Rikuo; Ohota, Yutaka; Yamamoto, Yoichi; Sumitomo, Yuji; Kobayashi, Toshio; and Aiba, Masahiko, 4,157,551, Cl. 346-75.000.
Ohta, Takaaki: *See*—
Nogami, Tomoyuki; and Ohta, Takaaki, 4,157,205, Cl. 303-24.00A.

Ohta, Tatsuo; and Harada, Yoshiaki, to Konishiroku Photo Industry Co., Ltd. Multi-color electro-static image liquid development apparatus. 4,157,219, Cl. 355-10.000.
Okada, Takashi: *See—*
Kuniyoshi, Yasunobu; Okada, Takashi; and Sumi, Takao, 4,157,565, Cl. 358-8.000.
Okatani, Masanao; Ishibashi, Yoshiaki; and Sugai, Yoshiro, to Pioneer Electronic Corporation. FM stereophonic receiver having muting and mode changing. 4,157,455, Cl. 179-1.0GM.
Okuzumi, Yuzi; Mellon, A. Darline; and Wasserman, David, to Ethicon, Inc. Addition copolymers of lactide and glycolide and method of preparation. 4,157,437, Cl. 528-354.000.
Olin Corporation: *See—*
Lines, Ellwood L.; Fairbrother, Robert J.; and Herbst, John A., 4,157,346, Cl. 260-348.310.
Olinkraft, Inc.: *See—*
Mesman, James W., 4,157,210, Cl. 350-97.000.
Ollendick, Gary B., to Teletype Corporation. Method and apparatus for removing paper from a rotating drum. 4,157,178, Cl. 271-276.000.
Olson, Kathleen R.: *See—*
Primiano, Michael P., 4,157,468, Cl. 250-223.00R.
Olson, Ronald R.: *See—*
Primiano, Michael P., 4,157,468, Cl. 250-223.00R.
Olympus Optical Co., Ltd.: *See—*
Kimura, Katsuhiko; and Miyashita, Kiyoshi, 4,157,260, Cl. 96-1.50R.
Satoh, Ken; and Yanagida, Tuneo, 4,157,575, Cl. 360-74.100.
O'Malley, John J., to General Motors Corporation. Four speed power transmission with overdrive. 4,157,046, Cl. 74-763.000.
Omokawa, Hiroyoshi: *See—*
Takematsu, Tetsuo; Konnai, Makoto; and Omokawa, Hiroyoshi, 4,157,257, Cl. 71-103.000.
Ono, Hiroshi; and Inoue, Shigeru, to Mitsui Toatsu Chemicals, Inc. Process for preparing guanidine. 4,157,348, Cl. 260-564.00D.
Ono, Hisatake: *See—*
Kubotera, Kikuo; Kashiwabara, Akira; Sato, Kotaro; Ono, Hisatake; Sato, Hideo; and Mizobuchi, Yuzo, 4,157,262, Cl. 96-29.00R.
Onopchenko, Anatoli; and Schulz, Johann G., to Gulf Research & Development Company. Process for recovering a dialkylarylketone. 4,157,353, Cl. 260-591.000.
Orlando, Franklin P.; and Droll, Ronald W., to FMC Corporation. Direct-loading crop harvesting apparatus. 4,157,005, Cl. 56-228.000.
Oros, Stefan, to Anatronics Corporation. Wireless alarm system. 4,157,540, Cl. 340-539.000.
Orth, Edward D.; and Schultz, William J., to General Electric Company. Method of making a halogen sensor. 4,157,311, Cl. 252-408.000.
Osako, Akitada: *See—*
Endo, Seiji; Kashihara, Takao; Osako, Akitada; Shizuki, Tatsuhiko; and Ikegami, Tadashi, 4,157,436, Cl. 528-167.000.
Ostbo, Nils. Vertical boiler. 4,157,078, Cl. 122-182.00S.
Otobe, Takashi: *See—*
Ohki, Hiroshi; Otobe, Takashi; and Kojima, Chiaki, 4,157,568, Cl. 358-128.000.
Outboard Marine Corporation: *See—*
Smith, LaVerne D.; and Wulff, William H., 4,157,083, Cl. 123-179.00P.
Owens, Kenneth R., to Regency Electronics. Plural band scanning radio with direct switch of RF amplifying transistors. 4,157,505, Cl. 325-470.000.
Pace, Inc.: *See—*
Walton, John F., 4,157,481, Cl. 307-252.00B.
Pampuch, Klaus, to Auergesellschaft GmbH. Respirator. 4,157,091, Cl. 128-142.00R.
Pannekeet, Wilhelmus: *See—*
van den Berg, Gerrit H.; Pannekeet, Wilhelmus; Koerts, Kees; and Smakman, Robert, 4,157,298, Cl. 210-30.00R.
Panzer, Hans P.; and Acholonu, Kenny U., to American Cyanamid Company. Process for preparation of 2-vinyltetrahydropyrimidines. 4,157,442, Cl. 544-242.000.
Papenfuhs, Theodor; and Volk, Heinrich, to Hoechst Aktiengesellschaft. Water-insoluble disazomethine mixed metal-complex compounds, process for preparing them and their use as colorants. 4,157,265, Cl. 106-288.00Q.
Paraskos, John A.; and Taylor, Herman, Jr., to Gulf Research & Development Company. Process for extending life of coal liquefaction catalyst. 4,157,291, Cl. 208-10.000.
Parcor: *See—*
Sauter, Fritz, 4,157,399, Cl. 424-275.000.
Paris Manufacturing Company, Inc.: *See—*
Sanko, John R., 4,157,151, Cl. 223-13.000.
Parker-Hannifin Corporation: *See—*
Sharp, Bernard C., 4,156,951, Cl. 15-250.420.
Parry, Stephen H.; and Porter, Philip, to Internationale Octrooi Maatschappij "Octropa" B.V. Process for vaccine preparation. 4,157,390, Cl. 424-92.000.
Partridge, Austin A.: *See—*
Partridge, Roger J.; and Callaway, James S., 4,156,956, Cl. 27-4.000.
Partridge, Richard L.: *See—*
Gannon, Patrick M.; Jones, Julius D.; Junod, Dale M.; Partridge, Richard L.; and Wright, Thomas R., 4,157,586, Cl. 364-200.000.
Partridge, Roger J.; and Callaway, James S., to Partridge, Austin A.; and Partridge, Viola M. Foldable cardboard casket. 4,156,956, Cl. 27-4.000.
Partridge, Viola M.: *See—*
Partridge, Roger J.; and Callaway, James S., 4,156,956, Cl. 27-4.000.
Patel, Bhupendra C., to Kendall Company, The. Catheter with improved balloon and tip assembly. 4,157,094, Cl. 128-349.00B.
Patterson, Lawrence B. Deleaving and trimming machine with improved arrangement for adjusting speed and torque of roll. 4,157,175, Cl. 270-52.500.
Paul, Lynn E.: *See—*
Stowe, Grady K.; and Paul, Lynn E., 4,157,484, Cl. 313-94.000.
Paul, Michael W., to Barringer Research Limited. Pulse generation employing parallel resonant LC circuit for energizing a coil with square wave. 4,157,579, Cl. 361-152.000.
Paulson, Danton L.; and Worthington, Robert B., to United States of America, Interior. Method of agglomerating fine powders. 4,157,371, Cl. 264-114.000.
Pechalin, Lev I.: *See—*
Vulikh, Alexandr I.; Zagorskaya, Maina K.; Fokina, Natalia A.; Nikandrov, Gennady A.; Reznichenko, Lidia A.; Zverev, Mikhail P.; Barash, Arkady N.; Surkova, Valentina I.; Mavrin, Alexei M.; Troyan, Nikolai V.; Kalyanova, Nadezhda F.; Shimko, Ivan G.; Alovyainikov, Alexandr A.; and Pechalin, Lev I., 4,157,376, Cl. 423-240.000.
Peiffer, Robert W., to Du Pont de Nemours, E. I., and Company. Toning and solvent washout process for making conductive interconnections. 4,157,407, Cl. 427-54.000.
Peltz, Johnny W. Five speed motorcycle transmission. 4,157,044, Cl. 74-356.000.
Pennwalt Corporation: *See—*
Sandler, Stanley R.; and Sheldon, Donald A., 4,157,329, Cl. 260-45.75C.
Pera, John D.: *See—*
Buckman, John D.; Mercer, Gerald D.; and Pera, John D., 4,157,364, Cl. 260-976.000.
Percy du Sert, Pierre: *See—*
Brault, Yves; Carre, Roland; and Percy du Sert, Pierre, 4,157,546, Cl. 343-17.20R.
Perkin-Elmer Corporation, The: *See—*
Gordon, Robert; and Boyan, Gerard E., 4,157,218, Cl. 354-66.000.
Skolnick, Michael L., 4,157,223, Cl. 356-354.000.
Perrot, Friedrich, to ETA A.G. Ebauches-Fabrik. Mechanical watch movement. 4,157,008, Cl. 58-107.000.
Pershin, Gennady D.; Emelyanov, Valentin P.; and Schegolev, Gennady K., to Vsesojuzny Nauchno-Issledovatelsky Institut Metiznoi Promyshlennosti (Vniimetiz). Device for moving dies in a machine for the manufacture of twisted wire articles with alternating direction of twist. 4,157,102, Cl. 140-149.000.
Person, Herman R., to Dale Electronics, Inc. Indicia display device. 4,157,543, Cl. 340-758.000.
Pertec Corporation: *See—*
Desai, Ashok K.; Gami, Bipinchandra V.; and Dunstan, Eric M., 4,157,507, Cl. 328-134.000.
Peters, Jack. Self-locking hinge. 4,157,128, Cl. 182-24.000.
Peterson, David C., to Upjohn Company, The. ω-Aryl-12,13(e)-didehydro-13,14-dihydro-PGD compounds. 4,157,448, Cl. 560-53.000.
Peterson, James J.; and Cianci, James P., to Kendall Company, The. Maximum pressure manometer. 4,157,043, Cl. 73-709.000.
Peterson, Richard H.; and Jensen, Richard W. Indicating organ stop tablet. 4,157,051, Cl. 84-343.000.
Pfaff, Werner: *See—*
Hitzel, Volker; Weyer, Rudi; Pfaff, Werner; and Geisen, Karl, 4,157,395, Cl. 424-266.000.
Pfizer Inc.: *See—*
Bindra, Jasjit S.; Eggler, James F.; Johnson, Michael R.; and Schaaf, Thomas K., 4,157,341, Cl. 260-559.00B.
Philip, Thoni V.; and Krieble, Robert W., to Carpenter Technology Corporation. Case-hardening alloy steel and case-hardened article made therefrom. 4,157,258, Cl. 75-124.000.
Philipp, Herbert R., to General Electric Company. Polycrystalline varistors with reduced overshoot. 4,157,527, Cl. 338-21.000.
Phillips, Edward H. Multifocal length lens. 4,157,213, Cl. 351-168.000.
Phillips, Gary M., to Medtronic, Inc. Cathode materials. 4,157,433, Cl. 526-43.000.
Phillips, Jacque R. Short-term emergency survival breathing and eye-shielding. 4,157,090, Cl. 128-141.00R.
Phillips, Joseph L., to United States of America, Air Force. Hydraulic drill unit. 4,157,231, Cl. 408-1.00R.
Phillips, Lewis, Jr. Support for fishing rod. 4,156,982, Cl. 43-21.200.
Phillips Petroleum Company: *See—*
Brady, Donnie G., 4,157,273, Cl. 156-315.000.
DeForest, Laurence R.; and Richards, Frank P., 4,157,147, Cl. 220-455.000.
Hutchinson, William M., deceased; and Hutchinson, Florence M., executrix, 4,157,310, Cl. 252-364.000.
Pichette, Joseph L. Feed control adapter. 4,156,992, Cl. 51-215.00R.
Pickles, Allan E., to Carborundum Company, The. Furnace linings. 4,157,001, Cl. 52-506.000.
Pignataro, Vincenzo; and Portinari, Giovanni, to Industrie Pirelli Societa per Azioni. Electric power cable with improved screen and method of manufacture thereof. 4,157,452, Cl. 174-36.000.
Pinto, Joseph G.; and Lawlor, Christopher, to Sherwin-Williams Company, The. Reversible airless spray nozzle. 4,157,163, Cl. 239-119.000.
Pioneer Cover-All, Inc.: *See—*
Bachand, Ernest C., 4,157,202, Cl. 296-100.000.

Pioneer Electronic Corporation: *See—*
Okatani, Masanao; Ishibashi, Yoshiaki; and Sugai, Yoshiro, 4,157,455, Cl. 179-1.0GM.

Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., to Mobil Oil Corporation. Aromatization of C_2-C_{10} hydrocarbons over stabilized zinc-containing zeolites. 4,157,293, Cl. 208-135.000.

Plockinger, Erwin; Kuhnelt, Gert; and Machner, Peter, to Vereinigte Edelstahlwerke Aktiengesellschaft (VEW). Method of producing ingots of unalloyed and alloyed steels. 4,157,110, Cl. 164-52.000.

Plummer, William T., to Polaroid Corporation. Adapter for optically coupling a photographic camera with a viewing device. 4,157,216, Cl. 354-62.000.

Poclain Hydraulics: *See—*
Allart, Bernard R.; and Ramousse, Patrick E., 4,157,056, Cl. 91-491.000.

Podboronov, Boris P.: *See—*
Kornienko, Marat I.; Furman, Anatoly V.; Podboronov, Boris P.; and Shevchuk, Vyacheslav V., 4,157,494, Cl. 323-79.000.

Pohl, Siegfried: *See—*
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,157,244, Cl. 48-62.00R.

Polaroid Corporation: *See—*
Plummer, William T., 4,157,216, Cl. 354-62.000.

Poley, Roger G. Trailer hitch bracket. 4,157,189, Cl. 280-490.00R.

Polyakova, Victoria P.: *See—*
Smirnov, Viktor S.; Gryaznov, Vladimir M.; Lebedeva, Valentina I.; Mischenko, Alexandr P.; Polyakova, Victoria P.; and Savitsky, Evgeny M., 4,157,354, Cl. 585-434.000.

Pont-a-Mousson S.A.: *See—*
Lagabe, Andre E. R.; and Prevotat, Bernard A., 4,157,235, Cl. 425-71.000.

Poore, Bernard B., to Deere & Company. Vehicular single shaft gas turbine engine power system. 4,157,124, Cl. 180-105.00E.

Porter, Philip: *See—*
Parry, Stephen H.; and Porter, Philip, 4,157,390, Cl. 424-92.000.

Porter, Townsend H., Jr.; and Schopp, Robert E., to International Business Machines Corporation. Rotatable storage apparatus with digitally responsive circuitry for track selection. 4,157,577, Cl. 360-77.000.

Portinari, Giovanni: *See—*
Pignataro, Vincenzo; and Portinari, Giovanni, 4,157,452, Cl. 174-36.000.

Porvair Limited: *See—*
Boutle, David L., 4,157,424, Cl. 521-61.000.

Powers, Joseph: *See—*
Martin, Ronald G.; Powers, Joseph; and Trocciola, John C., 4,157,327, Cl. 260-42.270.

PPG Industries, Inc.: *See—*
Thomas, Dean L.; and Reese, Thomas J., 4,157,254, Cl. 65-273.000.

Praga, Claudio: *See—*
Maiorano, Michele; Valentini, Luigi; and Praga, Claudio, 4,157,086, Cl. 128-637.000.

Prahl, Walter H. Recovery of hydrogen chloride and chlorine from chlorine-containing organic wastes. 4,157,380, Cl. 423-488.000.

Pratt, Thomas J.: *See—*
Sadle, Alexander; and Pratt, Thomas J., 4,157,318, Cl. 260-17.200.

Press, Jeffery B.; and Safir, Sidney R., to American Cyanamid Company. 10-(Piperazinyl)thieno[3,4-b][1,5]benzoxazepines and 10-(piperazinyl)thieno[3,4-b][1,5]benzothiazepines. 4,157,444, Cl. 544-359.000.

Pretty, Frederick A., to USM Corporation. Presses having platen leveling means. 4,157,066, Cl. 100-46.000.

Prevorsek, Dusan C.; and Chung, Daniel C., to Allied Chemical Corporation. Thermoformable compositions comprising a crosslinked polycyanurate polymer and a thermoplastic polymer. 4,157,360, Cl. 260-860.000.

Prevotat, Bernard A.: *See—*
Lagabe, Andre E. R.; and Prevotat, Bernard A., 4,157,235, Cl. 425-71.000.

Prieskorn, Kenneth M., to AMF Incorporated. Lead for resistor element. 4,157,529, Cl. 338-275.000.

Primiano, Michael P., to Olson, Ronald R.; and Olson, Kathleen R. Method and apparatus for counting particles of particulate material. 4,157,468, Cl. 250-223.00R.

Procter & Gamble Company, The: *See—*
Benedict, James J., 4,157,387, Cl. 424-54.000.
Jaeger, Mark S.; and Davis, James E., 4,157,307, Cl. 252-8.750.

Purzycki, Alfred Z.; and Randolph, John E., to Teletype Corporation. Ribbon advancing mechanism. 4,157,224, Cl. 400-233.000.

Queiser, Horst, to Kraftwerk Union Aktiengesellschaft. Method for treating gaseous nuclides and gas system for ventilating tanks containing radioactive liquid. 4,157,248, Cl. 55-66.000.

Quinton, Richard J. Automobile theft prevention system. 4,157,478, Cl. 307-10.0AT.

R. T. Engineering Service Inc.: *See—*
Cain, Ralph E., Jr.; and Crowell, Thomas J., 4,157,501, Cl. 324-115.000.

Racine Railroad Products, Inc.: *See—*
McIlrath, William P., 4,156,991, Cl. 51-178.000.

Radar Control Systems: *See—*
Davis, John W., 4,157,549, Cl. 343-786.000.

Raley, Garland E., to Ethyl Corporation. Molding element for producing thermoplastic film. 4,157,237, Cl. 425-363.000.

Ramer, Paul C. Ski binding. 4,157,191, Cl. 280-614.000.

Ramousse, Patrick E.: *See—*
Allart, Bernard R.; and Ramousse, Patrick E., 4,157,056, Cl. 91-491.000.

Randall, Russel R., to Dresser Industries, Inc. Pulsed neutron well logging apparatus having means for determining background radiation. 4,157,469, Cl. 250-262.000.

Randolph, John E.: *See—*
Purzycki, Alfred Z.; and Randolph, John E., 4,157,224, Cl. 400-233.000.

Rauen, Raymond J., to Guardian Industries Corporation. Strip printer adjustable mask and marker. 4,157,221, Cl. 355-29.000.

Raytheon Company: *See—*
Schmoock, James C., 4,157,512, Cl. 330-260.000.
Smith, William V.; Gilliatt, Charles L.; and Edgar, Richard H., 4,157,464, Cl. 219-10.55R.

RB Toy Development Co.: *See—*
Kupperman, Sam; and Kupperman, Dennis, 4,156,986, Cl. 46-201.000.

RCA Corporation: *See—*
Berkman, Samuel; Kim, Kyong-Min; and Temple, Harold E., 4,157,373, Cl. 422-246.000.
Gale, Michael T.; and Knop, Karl, 4,157,220, Cl. 355-19.000.
Hanak, Joseph J., 4,157,215, Cl. 354-1.000.
Hernqvist, Karl G., 4,157,253, Cl. 65-2.000.

Recard, Richard H., Jr. Game apparatus. 4,157,184, Cl. 273-253.000.

Recognition Equipment Incorporated: *See—*
DuVall, Dale R., 4,157,533, Cl. 340-146.3AG.

Redington Inc.: *See—*
Vogel, Walter H., 4,157,058, Cl. 93-36.300.

Reed International Limited: *See—*
Attenburrow, David J., 4,156,946, Cl. 5-81.00R.

Reed, Robert D., to John Zink Company. Molecular seal improvement action. 4,157,239, Cl. 431-202.000.

Reed Tool Company: *See—*
Bailey, Stuart L., 4,157,057, Cl. 92-87.000.

Reese, Thomas J.: *See—*
Thomas, Dean L.; and Reese, Thomas J., 4,157,254, Cl. 65-273.000.

Regehr, Ulrich; and Bulang, Siegfried, to Regehr, Ulrich. Scrubber apparatus for washing gases and having a coarse and fine droplet separator. 4,157,250, Cl. 55-233.000.

Regency Electronics: *See—*
Owens, Kenneth R., 4,157,505, Cl. 325-470.000.

Reid and Scott F. Reid, Betty Jane: *See—*
Reid, Scott F., 4,157,017, Cl. 62-135.000.

Reid, Betty Jane: *See—*
Reid, Scott F., 4,157,017, Cl. 62-135.000.

Reid, Martin J.; and Terry, Robert W., to Alpha Industries, Inc. Microwave detecting device with microstrip feed line. 4,157,550, Cl. 343-786.000.

Reid, Scott F., to Reid, Betty Jane; and Reid and Scott F. Reid, Betty Jane, as trustees for Linda Marie, Jeffrey Alan and Michael David Reid. Continuous preparation of soft, melt-resistant, frozen confection. 4,157,017, Cl. 62-135.000.

Reiner, Alberto; and Rossi, Giacinto, to Marxer S.p.A. Therapeutically active d-glucosamine salts. 4,157,440, Cl. 536-27.000.

Reiter, Eric. Shaft connectors. 4,157,226, Cl. 403-209.000.

Rembaum, Alan: *See—*
Yen, Shiao-Ping S.; Rembaum, Alan; and Molday, Robert S., 4,157,323, Cl. 260-29.70M.

Reserve Synthetic Fuels, Inc.: *See—*
Collins, Robert H., III; and Love, Donald L. (said Robert H. Collins, III assors. to), 4,157,247, Cl. 55-31.000.

Reticon Corporation: *See—*
Weckler, Gene P., 4,157,558, Cl. 357-24.000.

Reynolds Metals Co.: *See—*
Sturwold, Robert J.; Utz, Walter E.; Christ, Nicholas; Ford, William R., Jr.; and Koch, George P., 4,157,422, Cl. 428-457.000.

Reznichenko, Lidia A.: *See—*
Vulikh, Alexandr I.; Zagorskaya, Maina K.; Fokina, Natalia A.; Nikandrov, Gennady A.; Reznichenko, Lidia A.; Zverev, Mikhail P.; Barash, Arkady N.; Surkova, Valentina I.; Mavrin, Alexei M.; Troyan, Nikolai V.; Kalyanova, Nadezhda F.; Shimko, Ivan G.; Alovyainikov, Alexandr A.; and Pechalin, Lev I., 4,157,376, Cl. 423-240.000.

Rhone-Poulenc-Textile: *See—*
Bourrain, Paul; and Giroud, Pierre, 4,157,420, Cl. 428-392.000.

Rice, Warren: *See—*
Hosterman, Craig; and Rice, Warren, 4,157,015, Cl. 62-115.000.

Richards, Frank P.: *See—*
DeForest, Laurence R.; and Richards, Frank P., 4,157,147, Cl. 220-455.000.

Rick, Edward A.: *See—*
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Fleckenstein, Wolfgang; and Rinne, Helmut, 4,157,288, Cl. 204-195.00P.

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Aberer, James B., 4,157,130, Cl. 182-198.000.

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Schlagmuller, Walter; and Babitzka, Rudolf, 4,157,168, Cl. 251-52.000.
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Roberts, Lincoln E.; and Young, Walter M., to AMP Incorporated. Waterproof splice electrical connector. 4,157,208, Cl. 339-98.000.
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Evans, Francis E.; Lind, Charles J.; Eibeck, Richard E.; and Robinson, Martin A., 4,157,377, Cl. 423-276.000.
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Robinson, Samuel C., 4,157,207, Cl. 339-17.00C.
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Roche, Alain Y. D. Circuit for use either as a serial-parallel converter and multiplexer or a parallel-serial converter and demultiplexer in digital transmission systems. 4,157,458, Cl. 179-15.00A.
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Eisen, Fred H.; Zucca, Ricardo; and Welch, Bryant, 4,157,497, Cl. 324-62.000.
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Fleckenstein, Albrecht; Janke, Johanna; Lossnitzer, Klaus; and Voelger, Karl-Dieter, 4,157,394, Cl. 424-251.000.
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Doll, Friedhelm; and Rolff, Jacob, 4,157,035, Cl. 73-194.0EM.
Rosen, Leo. Cryptographic telegram transmission system. 4,157,453, Cl. 178-22.000.
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Plank, Charles J.; Rosinski, Edward J.; and Givens, Edwin N., 4,157,293, Cl. 208-135.000.
Ross, Edward E., to Del Monte Corporation. Apparatus and methods for controlling the feeding of wet materials. 4,157,037, Cl. 73-304.00R.
Ross, Gordon W.; Gardner nee Marshall, Monica J.; and Wolff, Walter, to Glaxo Laboratories Limited. Immunostimulatory agents. 4,157,278, Cl. 195-4.000.
Ross, John A., to Goodyear Tire & Rubber Company, The. Hose structure. 4,157,101, Cl. 138-130.000.
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Reiner, Alberto; and Rossi, Giacinto, 4,157,440, Cl. 536-27.000.
Roth, Leo; and Roth, Ursula. Wheel rotation indicator. 4,157,076, Cl. 116-215.000.
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Watson, Hugh R.; Rowsell, David G.; and Browning, John H. D., 4,157,384, Cl. 424-45.000.
Rueter, Joern; Burzin, Klaus; Magosch, Karl-Heinz; and Feinauer, Roland, to Chemische Werke Huels Aktiengesellschaft. Process for the production of cyclic diesters of dodecanedioic acid. 4,157,330, Cl. 260-340.200.
Ruhl, Edward A., to USM Corporation. Unitary plastic hinged article and method of making. 4,157,413, Cl. 428-159.000.
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Auer, John H., Jr.; and Rutherford, David B., Jr., 4,157,580, Cl. 361-167.000.
Rutkowski, Edward, to United States Steel Corporation. Gauging attachment for a rotary cutting tool. 4,156,990, Cl. 51-170.0PT.
Ryan, Timothy A. Golf ball pick-up apparatus. 4,157,141, Cl. 414-440.000.
Ryer, Jack; Miller, Harold N.; Zielinski, James; and Brois, Stanley J., to Exxon Research & Engineering Co. Additive useful in oleaginous compositions. 4,157,243, Cl. 44-63.000.
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Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,157,244, Cl. 48-62.00R.
Sadle, Alexander; and Pratt, Thomas J., to International Paper Company. Starch carrier composition for adhesive containing urea as a selatinizing agent. 4,157,318, Cl. 260-17.200.
Safir, Sidney R.: *See*—
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Sageman, David R.: *See*—
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Saggers, David T.: *See*—
Gates, Peter S.; Gillon, John; and Saggers, David T., 4,157,255, Cl. 71-76.000.
Sahni, Tilak R.: *See*—
Shereda, Daniel J.; and Sahni, Tilak R., 4,157,033, Cl. 73-161.000.
Sailer, Edward D., to General Electric Company. Gas turbine engine with power modulation capability. 4,157,010, Cl. 60-39.040.
St-Jean, Guy. Circuit for testing protection devices. 4,157,496, Cl. 324-28.00R.
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Crenshaw, Ronnie R.; Kavadias, Gerry; and Saintonge, Roger F., 4,157,340, Cl. 260-551.00C.
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Morishita, Nobuo; and Saito, Mitsutaka, 4,157,362, Cl. 260-878.00R.
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Kitame, Fumio; Saitoh, Hiroshi; and Ishida, Nakao, 4,157,391, Cl. 424-238.000.
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Tanaka, Yoshio; Togawa, Susumu; and Sakoda, Akinori, 4,157,111, Cl. 164-76.000.
Sakoe, Hiroaki; and Chiba, Seibi, to Nippon Electric Co., Ltd. Frequency analyzer comprising a digital band-pass and a digital low-pass filter section both operable in a time-division fashion. 4,157,457, Cl. 179-1.0SA.
Salle, Ralph D., to Borg-Warner Corporation. Torque responsive centrifugal clutch. 4,157,136, Cl. 192-103.00B.
Samuelson, Wayne H., to Avion Manufacturing Co. Furnace heating assembly and method of making the same. 4,157,241, Cl. 431-353.000.
Sanczuk, Stefan; and Hermans, Hubert K. Fr., to Janssen Pharmaceutica N.V. N-aryl-N-(1-L-4-piperidinyl)-arylacetamides. 4,157,393, Cl. 424-251.000.
Sandler, Stanley R.; and Sheldon, Donald A., to Pennwalt Corporation. Copper and cobalt carbonates as smoke suppressants for poly(vinyl halides). 4,157,329, Cl. 260-45.75C.
Sanko, John R., to Paris Manufacturing Company, Inc. Cap finishing machine. 4,157,151, Cl. 223-13.000.
Sashin, Donald: *See*—
Kennedy, William H.; and Sashin, Donald, 4,157,572, Cl. 360-33.000.
Sato, Hideo: *See*—
Kubotera, Kikuo; Kashiwabara, Akira; Sato, Kotaro; Ono, Hisatake; Sato, Hideo; and Mizobuchi, Yuzo, 4,157,262, Cl. 96-29.00R.
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Sato, Shuichi; Hirabayashi, Makoto; Hirata, Yoshimi; and Yamada, Takaaki, to Sony Corporation. Control circuit for signal transmission. 4,157,557, Cl. 357-23.000.
Satoh, Ken; and Yanagida, Tuneo, to Olympus Optical Co., Ltd. Tape end warning apparatus. 4,157,575, Cl. 360-74.100.
Satoh, Susumu: *See*—
Yasuda, Nozomi; Terada, Kimio; Itagaki, Kazuo; Toyoshima, Yasuo; Maruzeni, Shouji; Itoh, Tadasu; Yokobori, Hideo; and Satoh, Susumu, 4,157,405, Cl. 426-607.000.
Satterwhite, Charles R., to Unit Rig & Equipment Co. Conveyor folding and moldboard operation for excavating and loading systems. 4,156,977, Cl. 37-190.000.
Sauter, Fritz, to Parcor. Benzo(B)thiophenes. 4,157,399, Cl. 424-275.000.
Savin Corporation: *See*—
Schultes, Max; and Eberlein, Dietmar, 4,157,059, Cl. 93-93.00C.
Savitsky, Evgeny M.: *See*—
Smirnov, Viktor S.; Gryaznov, Vladimir M.; Lebedeva, Valentina I.; Mischenko, Alexandr P.; Polyakova, Victoria P.; and Savitsky, Evgeny M., 4,157,354, Cl. 585-434.000.
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Doria, Gianfederico; Giraldi, Piernicola; Lauria, Francesco; Corno, Maria L.; Sberze, Piero; and Tibolla, Marcello, 4,157,334, Cl. 260-345.200.
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Bindra, Jasjit S.; Eggler, James F.; Johnson, Michael R.; and Schaaf, Thomas K., 4,157,341, Cl. 260-559.00B.
Schaberg, Richard R., to Gould Inc. Electrically isolated strain gage assembly. 4,157,032, Cl. 73-141.00A.
Schachter, Jacob. Locking system for hotels. 4,157,534, Cl. 340-147.0MD.
Schegolev, Gennady K.: *See*—
Pershin, Gennady D.; Emelyanov, Valentin P.; and Schegolev, Gennady K., 4,157,102, Cl. 140-149.000.
Schiffmann, Robert F.; Mirman, Alfred H.; Grillo, Richard J.; and Wouda, Sally A., to International Telephone & Telegraph Corporation. Microwave baking of brown and serve products. 4,157,403, Cl. 426-234.000.
Schinko, Konrad. Juice extractor. 4,157,065, Cl. 100-45.000.
Schlagmuller, Walter; and Babitzka, Rudolf, to Robert Bosch GmbH. Electromagnetically operated valve structure. 4,157,168, Cl. 251-52.000.
Schmidle, Claude J.; and Barclay, Robert, Jr., to Thiokol Corporation. Photocurable compositions comprising a polythiol and a polyene derived from a vinyl acetal. 4,157,421, Cl. 428-419.000.
Schmidt, Theodore C.: *See*—
Scott, James K.; and Schmidt, Theodore C., 4,157,154, Cl. 228-140.000.
Schmitt, Frederick L.: *See*—
Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,157,351, Cl. 260-586.00R.
Schmoock, James C., to Raytheon Company. Electronic circuitry having transistor feedbacks and lead networks compensation. 4,157,512, Cl. 330-260.000.
Schneider, Hans: *See*—
Weiler, Herbert; Schneider, Hans; and Weyrich, Ludwin, 4,157,144, Cl. 215-252.000.
Scholz, Werner, to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec. Dropout detecting circuitry for a frequency

modulated carrier, particularly for a video recorder. 4,157,567, Cl. 358-127.000.

Schopp, Robert E.: *See—*
Porter, Townsend H., Jr.; and Schopp, Robert E., 4,157,577, Cl. 360-77.000.

Schreiber, Adam; Zollinger, Hans; and Dexel, Michael, to Sulzer Brothers Limited. Total ankle prosthesis. 4,156,944, Cl. 3-1.910.

Schultes, Max; and Eberlein, Dietmar, to Savin Corporation. Copy set separating tray for document copier. 4,157,059, Cl. 93-93.00C.

Schultz, William J.: *See—*
Orth, Edward D.; and Schultz, William J., 4,157,311, Cl. 252-408.000.

Schulz, Johann G.: *See—*
Onopchenko, Anatoli; and Schulz, Johann G., 4,157,353, Cl. 260-591.000.

Schwartz, Nelson N.: *See—*
Yankner, Paul R.; and Schwartz, Nelson N., 4,157,320, Cl. 260-28.50A.

Schwarz, Richard A.: *See—*
Hergenrother, William L.; Schwarz, Richard A.; Ambrose, Richard J.; and Hayes, Robert A., 4,157,429, Cl. 521-137.000.
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Scott, James K.; and Schmidt, Theodore C., to Hughes Aircraft Company. Method for forming patterns of brazing alloy. 4,157,154, Cl. 228-140.000.

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Hasselas, Kjell, 4,157,171, Cl. 254-67.000.

Sedlacek, Hans-Harald; Johannsen, Roloff; Seiler, Fritz; and Karges, Hermann, to Behringwerke Aktiengesellschaft. Tanned thrombocytes. 4,157,383, Cl. 424-3.000.

Seiler, Fritz: *See—*
Sedlacek, Hans-Harald; Johannsen, Roloff; Seiler, Fritz; and Karges, Hermann, 4,157,383, Cl. 424-3.000.

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Sekiya, Fukuo: *See—*
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Serebrennikov, Gennady Z.: *See—*
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SGS-ATES Componenti Elettronici S.p.A.: *See—*
Ghiringhelli, Giovanni; and Murari, Bruno, 4,157,513, Cl. 330-298.000.

Shaffer, Robert W.: *See—*
Weaver, H. William; and Shaffer, Robert W., 4,157,234, Cl. 418-6.000.

Sharp, Bernard C., to Parker-Hannifin Corporation. Windshield wiper blade unit and fastening clip. 4,156,951, Cl. 15-250.420.

Sharp Kabushiki Kaisha: *See—*
Takano, Rikuo; Ohota, Yutaka; Yamamoto, Yoichi; Sumitomo, Yuji; Kobayashi, Toshio; and Aiba, Masahiko, 4,157,551, Cl. 346-75.000.

Sheldon, Donald A.: *See—*
Sandler, Stanley R.; and Sheldon, Donald A., 4,157,329, Cl. 260-45.75C.

Sheng, Henry P.: *See—*
Busker, Leroy H.; and Sheng, Henry P., 4,157,236, Cl. 425-174.80E.

Shereda, Daniel J.; and Sahni, Tilak R., to Link Engineering Company. Spring tester. 4,157,033, Cl. 73-161.000.

Sherwin-Williams Company, The: *See—*
Pinto, Joseph G.; and Lawlor, Christopher, 4,157,163, Cl. 239-119.000.

Sherwood, Patricia E.: *See—*
Sherwood, Roy A.; and Sherwood, Patricia E., 4,157,074, Cl. 115-12.00A.

Sherwood, Roy A.; and Sherwood, Patricia E. Water jet propulsion device. 4,157,074, Cl. 115-12.00A.

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Shibayama, Shoichi: *See—*
Hiraga, Kunikazu; Shibayama, Shoichi; Yanai, Isao; and Harada, Tatsuo, 4,157,256, Cl. 71-95.000.

Shimizu, Koh: *See—*
Suganami, Takashi; Manzeki, Teruo; Takeda, Tashiro; Nakayama, Tetsuya; Shimizu, Koh; Kurihara, Keishiro; Fukumura, Tohru; and Hatogai, Naomi, 4,157,118, Cl. 172-4.500.

Shimko, Ivan G.: *See—*
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Shin Meiwa Industry Co., Ltd.: *See—*
Agoh, Hitoshi, 4,156,961, Cl. 29-566.300.

Shionogi & Co., Ltd.: *See—*
Homma, Yuzuru; and Morihara, Kazuyuki, 4,157,389, Cl. 424-92.000.

Shizuki, Tatsuhiko: *See—*
Endo, Seiji; Kashihara, Takao; Osako, Akitada; Shizuki, Tatsuhiko; and Ikegami, Tadashi, 4,157,436, Cl. 528-167.000.

Shoffner, James P., to UOP Inc. Preparation of aromatic diamines. 4,157,343, Cl. 260-570.900.

Shu, Stephen K., to Del Mar Avionics. Frame-by-frame memory display system. 4,157,571, Cl. 360-8.000.

Shuck, Lowell Z.; and Larcher, Earl L., to United States of America, Energy. Wellbore pressure transducer. 4,157,528, Cl. 338-42.000.

Siemens Aktiengesellschaft: *See—*
Hassler, Dieter, 4,157,502, Cl. 324-123.00R.

Sih, John C., to Upjohn Company, The. 7,8-Didehydro-2-decarboxy-2-hydroxymethyl-PGI_1 compounds. 4,157,441, Cl. 542-426.000.

Simon, David J.; and Costello, Edward C., to Singer Company, The. Correction circuit for a digital to synchro/resolver converter. 4,157,538, Cl. 340-347.0SY.

Simonetti, Enrico: *See—*
Bujatti, Marina; Misiano, Carlo; and Simonetti, Enrico, 4,157,284, Cl. 204-15.000.

Sims, Royal W. Tag axle support for concrete mixer units. 4,157,188, Cl. 280-81.00R.

Singer Company, The: *See—*
Aghazadeh, Shirzad; and Stahle, Howard L., 4,157,573, Cl. 360-51.000.
Hunts, Barney D.; and Brennan, Martin, 4,157,539, Cl. 340-365.00C.
Simon, David J.; and Costello, Edward C., 4,157,538, Cl. 340-347.0SY.

Skaggs, Boyd T., to Container Corporation of America. Partition arrangement. 4,157,156, Cl. 229-15.000.

Skolnick, Michael L., to Perkin-Elmer Corporation, The. Sliding reference interferometer. 4,157,223, Cl. 356-354.000.

Slocombe, Robert J.: *See—*
Fields, Joseph E.; and Slocombe, Robert J., 4,157,431, Cl. 526-15.000.

Smakman, Robert: *See—*
van den Berg, Gerrit H.; Pannekeet, Wilhelmus; Koerts, Kees; and Smakman, Robert, 4,157,298, Cl. 210-30.00R.

Smirnov, Viktor S.; Gryaznov, Vladimir M.; Lebedeva, Valentina I.; Mischenko, Alexandr P.; Polyakova, Victoria P.; and Savitsky, Evgeny M. Cycloparaffin dehydrogenation to form aromatics using palladium alloy foil. 4,157,354, Cl. 585-434.000.

Smith, Gary E.: *See—*
Burkhardt, Daniel F.; Evers, Carl A.; Kohnen, Anthony H.; Kohnen, Robert L.; Smith, Gary E.; and Wittman, Thomas J., 4,157,281, Cl. 202-176.000.

Smith International, Inc.: *See—*
Crase, Gary M., 4,157,022, Cl. 64-32.00R.

Smith, James D. B., to Westinghouse Electric Corp. Resin rich polybutadiene-mica flexible high voltage insulation. 4,157,414, Cl. 428-283.000.

Smith, LaVerne D.; and Wulff, William H., to Outboard Marine Corporation. Combination manual and power starter for engines. 4,157,083, Cl. 123-179.00P.

Smith, Patrick W. Electrical receptacle assembly with plug removal alarm. 4,157,542, Cl. 340-568.000.

Smith, Thomas M. Sealing apparatus and method. 4,157,155, Cl. 228-183.000.

Smith, William V.; Gilliatt, Charles L.; and Edgar, Richard H., to Raytheon Company. Microwave heating system. 4,157,464, Cl. 219-10.55R.

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Beardmore, Geoffrey; and Evans, Hugh N., 4,157,465, Cl. 219-121.0EM.

Societe Chimique des Charbonnages — CdF Chimie: *See—*
Leca, Jean-Paul; and Nardi, Alain, 4,157,029, Cl. 73-55.000.

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Nicoli, Jacques A. G., 4,157,500, Cl. 324-83.00R.

Soga, George, to Soga Packaging Machinery Co. Ltd. Material portioning apparatus and method. 4,157,064, Cl. 100-39.000.

Soga Packaging Machinery Co. Ltd.: *See—*
Soga, George, 4,157,064, Cl. 100-39.000.

Sohrabi, Mehdi, to United States of America, Energy. Simplified fast neutron dosimeter. 4,157,473, Cl. 250-473.000.

Sony Corporation: *See—*
Kuniyoshi, Yasunobu; Okada, Takashi; and Sumi, Takao, 4,157,565, Cl. 358-8.000.
Ohki, Hiroshi; Otobe, Takashi; and Kojima, Chiaki, 4,157,568, Cl. 358-128.000.
Sato, Shuichi; Hirabayashi, Makoto; Hirata, Yoshimi; and Yamada, Takaaki, 4,157,557, Cl. 357-23.000.

Sorrells, Paul J., Jr., to MM Systems Corporation. Reglet and counterflashing. 4,156,993, Cl. 52-60.000.

Sparrow, Leslie F. Door structure and mechanism for sealing the gap between the closure member and framework. 4,156,989, Cl. 49-481.000.

Spencer, John D., to Combustion Engineering, Inc. Flame detector. 4,157,506, Cl. 328-6.000.

Stahle, Howard L.: *See—*
Aghazadeh, Shirzad; and Stahle, Howard L., 4,157,573, Cl. 360-51.000.

Stamer, Michael, to A. B. Dick Company. Noise reduction circuit for multiple gap magnetic head for automatic typewriter. 4,157,574, Cl. 360-66.000.

Stansfield, James F.: *See—*
Hauxwell, Frank; Stansfield, James F.; and Topham, Arthur, 4,157,266, Cl. 106-308.00N.

Stephens, Geoffrey B.: *See*—
Bergeron, David L.; and Stephens, Geoffrey B., 4,157,268, Cl. 148-1.500.
Sterling Drug Inc.: *See*—
Bell, Malcolm R.; Herrmann, John L., Jr.; and Akullian, Vahan, 4,157,349, Cl. 260-586.00F.
Steuer, Charles F.; and Steuer, Patricia A., to Lawrence Peska Associates, Inc., a part interest. Garage assembly for two-wheeled vehicles. 4,156,994, Cl. 52-65.000.
Steuer, Patricia A.: *See*—
Steuer, Charles F.; and Steuer, Patricia A., 4,156,994, Cl. 52-65.000.
Stock, Eberhard; and Taumann, Leonhard, to Applied Radiation Corporation. Electron accelerator comprising a target exposed to the electron beam. 4,157,475, Cl. 250-503.000.
Stoll, Charles. Bag with life preserving buoyant means. 4,157,134, Cl. 190-1.000.
Stopcircuit Societe Anonyme: *See*—
Lamarche, Andre G., 4,157,524, Cl. 337-68.000.
Storcel, Joseph A.: *See*—
Buszkiewicz, Bruno C.; and Storcel, Joseph A., 4,156,965, Cl. 29-754.000.
Storrie, Robert C.; and Coffey, Rufus T. Culvert cleanout device. 4,156,950, Cl. 15-104.30R.
Stowe, Grady K.; and Paul, Lynn E., to Varo, Inc. Pip inverter tube cathode housing. 4,157,484, Cl. 313-94.000.
Strecker, Hubert, to Dr. Otto C. Strecker KG.; and Bruderhaus Machinen GmbH. Apparatus for converting a stream of partly overlapping sheets into a stack. 4,157,177, Cl. 271-197.000.
Stroz, John J.; Bakal, Abraham I.; Witzel, Frank; and MacKay, Donald A. M., to Life Savers, Inc. Chewing gum having improved flavor duration and shelf-life. 4,157,401, Cl. 426-3.000.
Sturwold, Robert J.; Utz, Walter E.; Christ, Nicholas; Ford, William R., Jr.; and Koch, George P., to Emery Industries, Inc.; and Reynolds Metals Co. Aluminous metal sheet. 4,157,422, Cl. 428-457.000.
Suami, Tetsuo. Novel nitrosourea derivatives. 4,157,439, Cl. 536-22.000.
Sugai, Yoshiro: *See*—
Okatani, Masanao; Ishibashi, Yoshiaki; and Sugai, Yoshiro, 4,157,455, Cl. 179-1.0GM.
Suganami, Takashi; Manzeki, Teruo; Takeda, Tashiro; Nakayama, Tetsuya; Shimizu, Koh; Kurihara, Keishiro; Fukumura, Tohru; and Hatogai, Naomi, to Kabushiki Kaisha Komatsu Seisakusho. Automatic control systems for the working tool of a civil machine. 4,157,118, Cl. 172-4.500.
Sulzer Brothers Limited: *See*—
Schreiber, Adam; Zollinger, Hans; and Dexel, Michael, 4,156,944, Cl. 3-1.910.
Sumi, Takao: *See*—
Kuniyoshi, Yasunobu; Okada, Takashi; and Sumi, Takao, 4,157,565, Cl. 358-8.000.
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Sunds Aktiebolag: *See*—
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Turk, John. Thread protector device. 4,157,100, Cl. 138-96.00T.

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Van Hall, Floyd, to Liggett Group Inc. Apparatus and method for compacting multi-sectional particulate containing filters. 4,157,370, Cl. 264-113.000.
Vankrevelen, James A. Hitch alignment device and method. 4,156,972, Cl. 33-264.000.
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Watanabe, Hironori, to Kabushiki Kaisha Kawai Gakki Setsakusho. Organ performance supporting device. 4,157,049, Cl. 84-1.240.
Watson, Hugh R.; Rowsell, David G.; and Browning, John H. D., to Wilkinson Sword Limited. Compositions having a physiological cooling effect. 4,157,384, Cl. 424-45.000.
Wayner, Robert J.: *See*—
Gullo, James M.; Heilman, William P.; Wayner, Robert J.; and Moser, Robert E., 4,157,392, Cl. 424-249.000.
Weaver, H. William; and Shaffer, Robert W., to Ingersoll-Rand Company. Scroll-type two stage positive fluid displacement apparatus. 4,157,234, Cl. 418-6.000.
Weckler, Gene P., to Reticon Corporation. Bucket-brigade charge transfer means for filters and other applications. 4,157,558, Cl. 357-24.000.
Weed Eater, Inc.: *See*—
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Wegener, Willi A., to Envirotech Corporation. Drum construction for rotary drum filter. 4,157,301, Cl. 210-404.000.
Weiler, Herbert; Schneider, Hans; and Weyrich, Ludwin, to Behringwerke Aktiengesellschaft. Sterile closure cap. 4,157,144, Cl. 215-252.000.
Weinberg, Kurt: *See*—
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Weinberger, Arnold: *See*—
Grice, Donald G.; Johnson, David F.; and Weinberger, Arnold, 4,157,590, Cl. 364-787.000.
Weinstein, Berthold W., to United States of America, Energy. x- And y-axis driver for rotating microspheres. 4,157,490, Cl. 318-685.000.
Weisenburger, August. Expander device. 4,156,959, Cl. 29-225.000.
Welch, Bryant: *See*—
Eisen, Fred H.; Zucca, Ricardo; and Welch, Bryant, 4,157,497, Cl. 324-62.000.
Wendt, Robert F.; Acker, Jan R.; and Braton, Norman R. Cryogenic beach cleaner. 4,157,016, Cl. 62-123.000.
Werber, Fred W. K. R. Garment designing aid. 4,156,969, Cl. 33-14.000.
Werner, Peter; and Harsch, Klaus, to Robert Bosch GmbH. Speed control system for a universal a-c, d-c motor connected to an a-c network. 4,157,491, Cl. 318-798.000.
Wesselink, Gustaaf A.; and Hokkeling, Pieter, to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp with indium-bismuth-mercury amalgam. 4,157,485, Cl. 313-174.000.
West, Harold H., to APV Corporation. Combination pressure-vacuum relief and antipollution valve. 4,157,072, Cl. 114-74.00R.
Westberg, Jan: *See*—
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Western Electric Company, Inc.: *See*—
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Moates, Roger D.; Tomasic, Nicholas A.; and Leah, Charles W., 4,157,520, Cl. 335-230.000.
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Weyrich, Ludwin: *See*—
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White, Gilbert H., to Upjohn Company, The. Modified feed frames for tableting machine. 4,157,148, Cl. 222-346.000.
Wiktor, Dominick M., to Automatic Switch Company. Automatic transfer switch and bypass switch arrangement. 4,157,461, Cl. 200-18.000.
Wilgus, Donovan R.; and King, John M., to Chevron Research Company. Mannich base composition. 4,157,308, Cl. 252-42.700.
Wilgus, Donovan R.; and King, John M., to Chevron Research Company. Mannich base composition. 4,157,309, Cl. 252-42.700.
Wilkinson Sword Limited: *See*—
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Wilson Industries: *See*—
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Wilson, Richard A.; Mookherjee, Braja D.; and Taylor, William I., to International Flavors & Fragrances Inc. Process for preparing 1-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-1,3-butanedione and intermediates. 4,157,350, Cl. 260-586.00R.

Wilson, Richard A.: *See*—
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Wilson, Ronald J.: *See*—
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Wilson, Timothy F. Automatic bolt mechanism. 4,157,197, Cl. 292-179.000.

Winand, Rene F. P., to Universite Libre de Bruxelles. Method for preparing manganese chloride and manganese by igneous electrolysis of the manganese chloride obtained. 4,157,285, Cl. 204-64.00R.

Wittman, Thomas J.: *See*—
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Wolff Manufacturing Company: *See*—
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Wright, Richard L.: *See*—
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Wright, Thomas R.: *See*—
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Atsumi, Kenichi, 4,157,570, Cl. 358-215.000.

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Yanagida, Tuneo: *See*—
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Yankner, Paul R.; and Schwartz, Nelson N., to Technical Processing, Inc. Rubber processing aid. 4,157,320, Cl. 260-28.50A.

Yano, Nobumitsu; Fukinbara, Itaru; and Takano, Mitsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for obtaining yolk lecithin from raw egg yolk. 4,157,404, Cl. 426-429.000.

Yasuda, Nozomi; Terada, Kimio; Itagaki, Kazuo; Toyoshima, Yasuo; Maruzeni, Shouji; Itoh, Tadasu; Yokobori, Hideo; and Satoh, Susumu, to Asahi Denka Kogyo K. K. Cocoa butter substitutes and their preparation. 4,157,405, Cl. 426-607.000.

Yen, Shiao-Ping S.; Rembaum, Alan; and Molday, Robert S., to California Institute of Technology. Metal containing polymeric functional microspheres. 4,157,323, Cl. 260-29.70M.

Yokobori, Hideo: *See*—
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Kotaka, Mitsuo; Takahara, Hisao; Muraki, Kaisuke; Takahashi, Ryo; and Matsuura, Tamizo, 4,157,470, Cl. 250-345.000.

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Yoshikawa, Norihiro; and Suzuki, Ryoji, to Dengyosha Machine Works, Ltd. Biological waste water treatment apparatus and a method of producing the same. 4,157,303, Cl. 210-150.000.

Yoshikawa, Yoshitaka: *See*—
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Yoshimura, Susumu: *See*—
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Young, Harry E., to Container Corporation of America. Internal partition. 4,157,157, Cl. 229-28.00R.

Young, Otto V., to Libbey-Owens-Ford Company. Method of and devices for lubricating rotating torque transmitting couplings. 4,157,020, Cl. 64-9.00R.

Young, Walter M.: *See*—
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Yu, Hwa Nien: *See*—
Ning, Tak Hung; and Yu, Hwa Nien, 4,157,269, Cl. 148-1.500.

Zagorskaya, Maina K.: *See*—
Vulikh, Alexandr I.; Zagorskaya, Maina K.; Fokina, Natalia A.; Nikandrov, Gennady A.; Reznichenko, Lidia A.; Zverev, Mikhail P.; Barash, Arkady N.; Surkova, Valentina I.; Mavrin, Alexei M.; Troyan, Nikolai V.; Kalyanova, Nadezhda F.; Shimko, Ivan G.; Alovyainikov, Alexandr A.; and Pechalin, Lev I., 4,157,376, Cl. 423-240.000.

Zawadski, Thomas: *See*—
Lundberg, Robert D.; Makowski, Henry S.; Bock, Jan; and Zawadski, Thomas, 4,157,432, Cl. 526-31.000.

Zengel, Hans; and Bergfeld, Manfred, to Akzona Incorporated. Benzene-1,3,5-tris-acetoxime and the process for making phloroglucinol therewith. 4,157,450, Cl. 568-763.000.

Zetter, Mark S., to Delphian Corporation. Sulfide monitoring system and method. 4,157,283, Cl. 204-1.00T.

Ziegelmeyer, Lynn J. Pipe cleaning machine. 4,156,949, Cl. 15-88.000.

Zielinski, James: *See*—
Ryer, Jack; Miller, Harold N.; Zielinski, James; and Brois, Stanley J., 4,157,243, Cl. 44-63.000.

Zielinski, Martin, to Honeywell Inc. Variable reference signal generating circuit and analog comparator utilizing hysteresis. 4,157,509, Cl. 328-147.000.

Zollinger, Hans: *See*—
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Zumbach Electronic AG: *See*—
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Zusman, Bertram. Cantilevered cross truss construction. 4,156,995, Cl. 52-73.000.

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Zyliss Zysset AG: *See*—
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LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 5TH DAY OF JUNE, 1979

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Adler, Franklin P., to Pullman Incorporated. Venting structure for railway car. T983,010, 6-5-79, Cl. 406-123.000.

Akiyama, Yoshinori; Ouki, Masami; and Suzuki, Masatosi, to Nippondenso Co. Ltd. Oxygen concentration detector. T983,005, 6-5-79, Cl. 204-195.00S.

Bailey, John M.; and Kranc, Stanley J., to Caterpillar Tractor Co. Injection nozzle assembly. T983,006, 6-5-79, Cl. 239-533.900.

Caterpillar Tractor Co.: *See*—
Bailey, John M.; and Kranc, Stanley J., T983,006, Cl. 239-533.900.

Coffey, Darius A. Unitary clamp for resealing milk cartons. T983,001, 6-5-79, Cl. 24-259.00R.

Coney, Charles H.; and Leonard, Don R. Dielectric coating compositions and recording sheets made therefrom. T983,002, 6-5-79, Cl. 428-498.000.

Coney, Charles H.: *See*—
Leonard, Don R.; and Coney, Charles H., T983,003, Cl. 428-335.000.

Du Pont de Nemours, E. I., and Company: *See*—
Treat, Theodore A., T983,009, Cl. 260-652.00P.

Evans, Robert J.: *See*—
Taylor, Marcia A.; and Evans, Robert J., T983,004, Cl. 428-467.000.

Giuliani, Sylvester W.; and Mercer, Arnold P., to International Business Machines Corporation. Arrangement for stabilizing a bipolar semiconductor device utilized in emitter follower or current switching configuration. T983,011, 6-5-79, Cl. 357-51.000.

Imperial Chemical Industries Limited: *See*—
Lawes, Hubert, T983,008, Cl. 260-42.000.

International Business Machines Corporation: *See*—
Giuliani, Sylvester W.; and Mercer, Arnold P., T983,011, Cl. 357-51.000.

Kranc, Stanley J.: *See*—
Bailey, John M.; and Kranc, Stanley J., T983,006, Cl. 239-533.900.

Lawes, Hubert, to Imperial Chemical Industries Limited. Mixing particulate additives into thermoplastics polymers. T983,008, 6-5-79, Cl. 260-42.000.

Leonard, Don R.; and Coney, Charles H. Coating compositions. T983,003, 6-5-79, Cl. 428-335.000.

Leonard, Don R. Cellulose ester acrylate resin-melamine-formaldehyde aqueous emulsion coating composition containing a combination surfactant-curing agent. T983,007, 6-5-79, Cl. 260-15.000.

Leonard, Don R.: *See*—
Coney, Charles H.; and Leonard, Don R., T983,002, Cl. 428-498.000.

Mercer, Arnold P.: *See*—
Giuliani, Sylvester W.; and Mercer, Arnold P., T983,011, Cl. 357-51.000.

Nippondenso Co. Ltd.: *See*—
Akiyama, Yoshinori; Ouki, Masami; and Suzuki, Masatosi, T983,005, Cl. 204-195.00S.

Ouki, Masami: *See*—
Akiyama, Yoshinori; Ouki, Masami; and Suzuki, Masatosi, T983,005, Cl. 204-195.00S.

Pullman Incorporated: *See*—
Adler, Franklin P., T983,010, Cl. 406-123.000.

Suzuki, Masatosi: *See*—
Akiyama, Yoshinori; Ouki, Masami; and Suzuki, Masatosi, T983,005, Cl. 204-195.00S.

Taylor, Marcia A.; and Evans, Robert J. Stabilized wax compositions and their preparation. T983,004, 6-5-79, Cl. 428-467.000.

Treat, Theodore A., to Du Pont de Nemours, E. I., and Company. Process for removing toxic perfluoroisobutylene. T983,009, 6-5-79, Cl. 260-652.00P.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF JUNE, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aiello, Salvatore F.: *See*—
Olson, Eugene; and Aiello, Salvatore F., Re. 30,021, Cl. 414-547.000.

Bullock, Norman J.; Wendt, Frank A.; De Pas, Laddie A.; and Goodman, Walter P., to W. M. Cissell Manufacturing Company. Seambusting and pressing apparatus. Re. 30,017, Cl. 38-1.00B.

Caterpillar Tractor Co.: *See*—
Clemens, Donald E.; and Haslett, Glenn M., Re. 30,018, Cl. 74-243.00R.

Chevron Research Company: *See*—
Lindquist, Robert H., Re. 30,019, Cl. 166-251.000.

Clemens, Donald E.; and Haslett, Glenn M., to Caterpillar Tractor Co. Sprocket member configuration. Re. 30,018, Cl. 74-243.00R.

De Pas, Laddie A.: *See*—
Bullock, Norman J.; Wendt, Frank A.; De Pas, Laddie A.; and Goodman, Walter P., Re. 30,017, Cl. 38-1.00B.

Goodman, Walter P.: *See*—
Bullock, Norman J.; Wendt, Frank A.; De Pas, Laddie A.; and Goodman, Walter P., Re. 30,017, Cl. 38-1.00B.

Haslett, Glenn M.: *See*—
Clemens, Donald E.; and Haslett, Glenn M., Re. 30,018, Cl. 74-243.00R.

Hawley, Robert L.; and Tuley, William B., to Ralston Purina Company. Method for protein fortification of extra pumped meats. Re. 30,023, Cl. 426-266.000.

Koppers Company, Inc.: *See*—
Krenke, Vincent G., Re. 30,022, Cl. 202-262.000.

Krenke, Vincent G., to Koppers Company, Inc. Pusher ram and quench car travel synchronization system. Re. 30,022, Cl. 202-262.000.

Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 4-Amino (or hydrazino)-2-(pyridinyl)pyrimidines. Re. 30,024, Cl. 544-328.000.

Lindquist, Robert H., to Chevron Research Company. Production of hydrocarbons from underground formations. Re. 30,019, Cl. 166-251.000.

Little Giant Industries Inc.: *See*—
Spencer, Edward; and Wing, Harold R., Re. 30,020, Cl. 182-153.000.

Loed Corporation: *See*—
Olson, Eugene; and Aiello, Salvatore F., Re. 30,021, Cl. 414-547.000.

Olson, Eugene; and Aiello, Salvatore F., to Loed Corporation. Material handling machine. Re. 30,021, Cl. 414-547.000.

Ralston Purina Company: *See*—
Hawley, Robert L.; and Tuley, William B., Re. 30,023, Cl. 426-266.000.

Singh, Baldev: *See*—
Lesher, George Y.; and Singh, Baldev, Re. 30,024, Cl. 544-328.000.

Spencer, Edward; and Wing, Harold R., to Little Giant Industries Inc. Foldable work platform. Re. 30,020, Cl. 182-153.000.

Sterling Drug Inc.: *See*—
Lesher, George Y.; and Singh, Baldev, Re. 30,024, Cl. 544-328.000.

Tuley, William B.: *See*—
Hawley, Robert L.; and Tuley, William B., Re. 30,023, Cl. 426-266.000.

W. M. Cissell Manufacturing Company: *See*—
Bullock, Norman J.; Wendt, Frank A.; De Pas, Laddie A.; and Goodman, Walter P., Re. 30,017, Cl. 38-1.00B.

Wendt, Frank A.: *See*—
Bullock, Norman J.; Wendt, Frank A.; De Pas, Laddie A.; and Goodman, Walter P., Re. 30,017, Cl. 38-1.00B.

Wing, Harold R.: *See*—
Spencer, Edward; and Wing, Harold R., Re. 30,020, Cl. 182-153.000.

LIST OF PLANT PATENTEES

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Acorn Engineering Co.: *See*—
Morris, Earl L.; and Fields, Larry, 252,035, Cl. D23-49.000.
Morris, Earl L.; and Fields, Larry, 252,036, Cl. D23-49.000.
Morris, Earl L.; and Fields, Larry, 252,037, Cl. D23-49.000.
Morris, Earl L.; and Fields, Larry, 252,038, Cl. D23-49.000.
Morris, Earl L.; and Fields, Larry, 252,039, Cl. D23-49.000.
Morris, Earl L.; and Fields, Larry O., 252,040, Cl. D23-49.000.

Adams, Teddie W. Sun-visor for vehicles. 252,023, 6-5-79, Cl. D12-191.000.

Adreon, Gary L., to Olinkraft, Inc. Display carton. 252,016, 6-5-79, Cl. D9-221.000.

Alps Motorola, Inc.: *See*—
Fujita, Kazumasa, 252,024, Cl. D14-12.000.

American Cyanamid Company: *See*—
Furlong, Thomas A.; and Grodin, Adam J., 252,014, Cl. D9-117.000.
Grodin, Adam J., 252,015, Cl. D9-168.000.
Grodin, Adam J., 252,018, Cl. D9-254.000.

American Tourister, Inc.: *See*—
Koffler, Sol, 252,055, Cl. D3-71.000.

Amerock Corporation: *See*—
Pittenger, Teresa R. B., 252,012, Cl. D8-302.000.

Apostolos, Nicholaos. Restaurant. 252,043, 6-5-79, Cl. D25-22.000.

Arnold, Kevin H. Gun rack. 252,001, 6-5-79, Cl. D6-157.000.

Baldwin, J. Grant, Jr.: *See*—
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Baldwin, said J. Grant, Jr.: *See*—
Permann, Vernon D.; and Baldwin, J. Grant, Jr. (said Vernon D. Permann assors. to), 252,011, Cl. D7-194.000.

Bautista, Macario D., Jr. Shower door caddy. 251,999, 6-5-79, Cl. D6-91.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
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Beller, Frank W., to Belson Manufacturing Co., Inc. Bird feeder. 252,046, 6-5-79, Cl. D30-15.000.

Belson Manufacturing Co., Inc.: *See*—
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Bristol-Myers Company: *See*—
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Burgess, John D.: *See*—
Jacuzzi, Virgil J.; and Burgess, John D., 252,042, Cl. D24-38.000.

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Cardinal Insulated Glass Co.: *See*—
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Carles, John B., to Bristol-Myers Company. Soap bar. 252,054, 6-5-79, Cl. D73-1.00A.

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Casey, Charles A., to M G F Industries Corporation. Bolt. 252,013, 6-5-79, Cl. D8-387.000.

Caterpillar Tractor Co.: *See*—
Pelly, Charles W., 251,997, Cl. D6-48.000.

Charlton Company, Inc.: *See*—
Spound, Albert M.; and Day, Robert C., 251,998, Cl. D6-47.000.

Cirrone, Umberto J. Bean bag game table. 252,047, 6-5-79, Cl. D21-24.000.

Computer Kinetics Corporation: *See*—
Calverley, Richard R., 252,026, Cl. D14-42.000.

Day, Robert C.: *See*—
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Tsuji, Masao, 252,003, Cl. D7-63.000.

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